

NAVY MEDICINE

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COVER: In this 1943 painting, artist Julian Levi portrayed a corpsman on the flight deck of USS *Yorktown*. *Navy Medicine* commemorates the 50th anniversary of the Navy Medical Department's participation in World War II. The Abbott Collection, Naval Historical Center.



Navy Medicine Was There . . . And Still Is

7 Dec 1991 marks the 50th anniversary of the Japanese raid on U.S. naval forces at Pearl Harbor. That attack, which led to the United States' involvement as an active combatant in the Second World War, was devastatingly successful.

Within 10 minutes of the attack, casualties started arriving at Naval Hospital Pearl Harbor. The staff of 40 medical officers, 54 nurses, and 331 enlisted personnel treated 250 patients during the first 3 hours on that day that lives in infamy.

The patient census at midnight was 960, and more than 200 ambulatory patients were treated and returned to their duty stations. USS *Solace*, which escaped damage, was the first to respond by sending rescue boats to pick up survivors of less fortunate ships. By the end of the day her crew had treated and released 80 patients and had admitted 132. The First and Third Defense Battalions jointly established three dressing stations and within 3 hours had outfitted a collecting and casualty dressing station. Navy Medical Department personnel manned battle dressing stations throughout the area to treat the injured. As always, Navy medicine quickly and effectively responded to the needs of those we serve.

The Pearl Harbor attack was dramatic evidence that America's age of isolationism had ended. As our country was transformed, so too was Navy medicine. World War II took our troops far away from our once protected shores: to the Aleutian Islands, the jungles of Southeast Asia, the deserts of North Africa, and the fields and hamlets of West and Central Europe. Whether on land, in the air, or on and beneath the sea, our sailors and marines were cared for by the dedicated professionals of the Navy Medical Department.

During World War II, our Medical Department under-

went unprecedented expansion. Before Pearl Harbor, we had about 5,000 officers and several hundred civilian employees. When the war ended, we had over 165,000 regular and reserve officers and enlisted military personnel and 13,500 civilian employees.

Over the next 50 years, Navy medicine continued growing to support our ever-expanding global commitments. Now, 50 years after Pearl Harbor, America is coming down from a similarly massive buildup of troops—one where Navy medicine responded just as swiftly and effectively. But America's peacetime prospect is now quite different. Not only are we coming home from a remarkably short war with relatively few casualties, we are also facing a world of rapidly changing political landscapes.

Fifty years ago, Japan radically changed our paradigm. Now, with the end of the cold war, the fall of the Berlin Wall and the Iron Curtain, the reunification of Germany, and the dissolution of the Soviet empire, we are again facing another paradigm shift. Today, the United States, with the rest of the world, is looking at the prospect of global peace, America is altering its defense budget to reflect that hope, and the military is looking at a massive drawdown. Yet our beneficiaries throughout the world—Navy and Marine Corps active duty, retired, and family members—will not decrease. We must continue to work innovatively and effectively to provide them with the care they need, deserve, and earned while making these changes possible.

Whether driven by rapid expansionism, shrinking resources, global economies, or withering empires, innovation is the key to adjusting to change. Our commitment to quality through continuous improvement will enable us to respond to the myriad of change sure to come.

VADM Donald F. Hagen, MC

RADM Stratton Becomes 17th Director of Nurse Corps

With over 150 Navy nurses from across the country in attendance, RADM Mariann Stratton, NC, became the 17th Director of the Navy Nurse Corps on 20 Sept 1991 at a change of command ceremony held at Admiral Leutze Park in the Washington Navy Yard.

The ceremony, which took place under sunny skies and brisk fall-like temperatures, also marked the retirement of RADM Mary Hall, NC, the Director of the Nurse Corps for the past 4 years.

In a voice that at times choked with emotion, RADM Hall thanked Navy nurses everywhere for the unflinching support they had given her during her tour. It was this type of loyalty she said, along with the Nurse Corps' magnificent "esprit de corps," that made her 33 years of active duty service so rewarding and worthwhile.

She challenged Navy nurses to continue "caring and sharing," and to take advantage of the increasing opportu-

nities being made available to them. RADM Hall also specifically singled out the 1,000 Navy nurses who had participated in Operation Desert Storm, describing them as the "golden threads that held the Navy medical tapestry together."

The ceremony's two principal speakers, VADM Donald Hagen, Surgeon General of the Navy, and the Honorable H. Lawrence Garrett III, Secretary of the Navy, both lauded RADM Hall as a visionary for not only the Nurse Corps and Navy medicine, but also for women in the Navy.

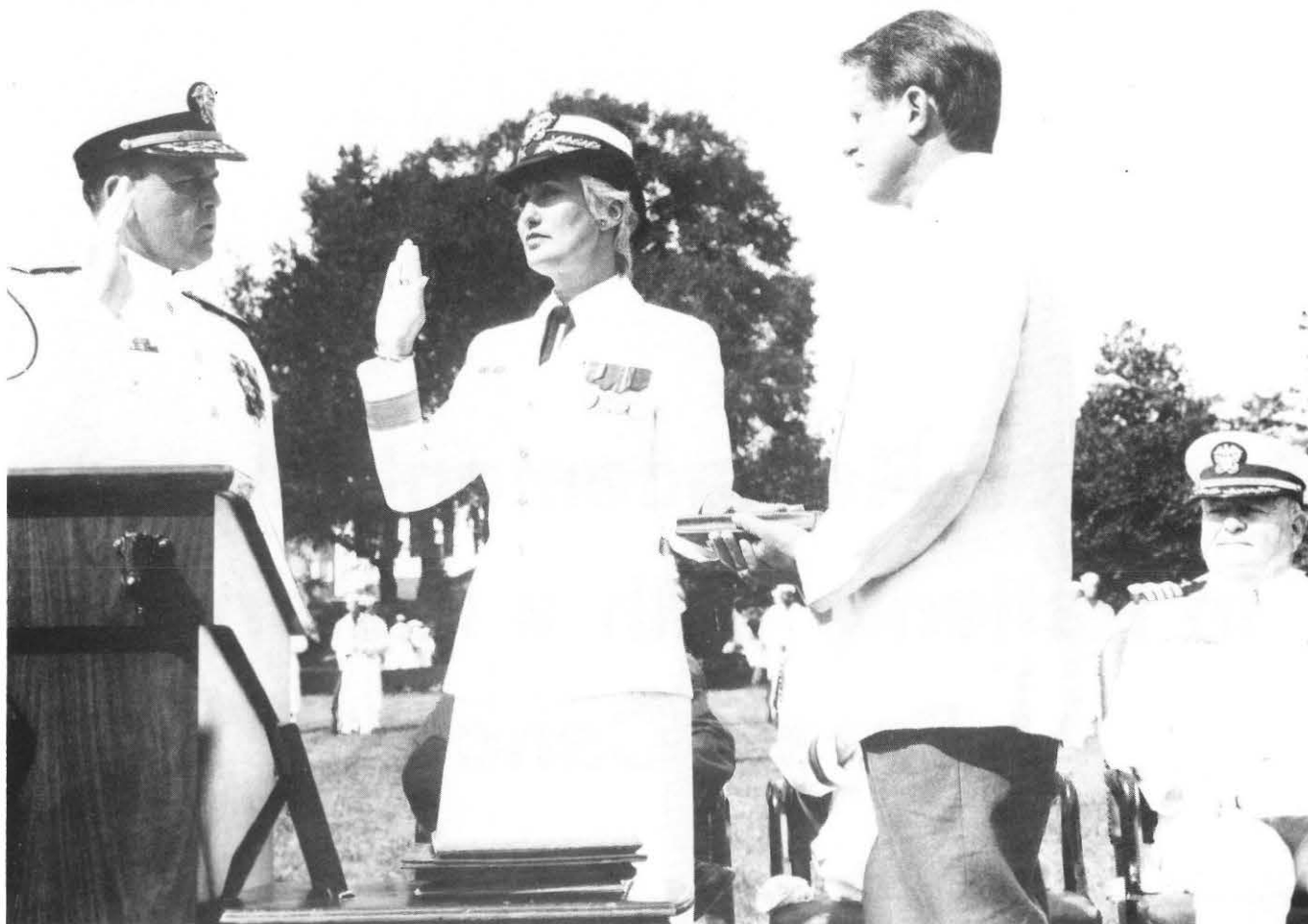
"Thanks to her strong leadership and vision," said VADM Hagen, "our Nurse Corps has grown into one of the most capable and competent organizations in military medicine. Even more importantly, when our sailors, marines, and Navy families think of Navy nurses they think of people who really care."

Secretary Garrett praised RADM Hall for formulating comprehensive

recruiting and retention initiatives that turned around worsening accessions in the Nurse Corps. On behalf of President Bush, he awarded RADM Hall the Distinguished Service Medal, making her the second Navy woman to receive this honor—the first to receive it while on active duty. She also received a personal letter of appreciation from the President and a proclamation from the governor of her home state, Pennsylvania. HMCM Charles Williams, Force Master Chief, presented RADM Hall with an American flag on behalf of all hospital corpsmen.

Upon taking the official oath of office from VADM Hagen, RADM Stratton pledged to maintain the standards of excellence established by RADM Hall, and voiced her commitment to providing the highest quality of care to Navy health care beneficiaries. □

—Story by LT Rob Newell, BUMED Public Affairs. Photos by HM2 Skip Singleton, NSHS, Bethesda, MD.



Above: Surgeon General of the Navy VADM Hagen, administers the oath of office to RADM Stratton as CAPT R.C. O'Connor, CHC, looks on. Holding Bible is RADM Stratton's brother, Max M. Stratton II. **Left:** SECNAV Garrett congratulates the retiring RADM Hall. At her side is Mr. Noel Hall.

Estrogen Replacement Therapy in Patients With a History of Breast Cancer

Issues, Dilemmas, and Management Options

CDR James N. Frame, MC, USNR

The administration of estrogen as replacement therapy in postmenopausal women has gained increased clinical use. The salutary effects of estrogen replacement therapy (ERT) include a reduction in vasomotor symptoms, improvements in the urogenital epithelium, a reduction in cardiovascular mortality, and a declination of osteoporotic bone fracture rates and mortality.(1,2) Complications resulting from ERT include a 4-12 fold increase risk of endometrial cancer; an effect negated by the addition of a progestational agent.(3,4) Other recognized complications include a 2.5 fold increase in gall bladder disease (cholelithiasis), impairment of liver function tests, vascular thromboses, and worsening of migraine headaches.(3)

There is considerable controversy relative to ERT and the subsequent risk of developing breast cancer.(3,5,6) A

growing body of information supports a causal relationship between ERT and breast cancer in women without a prior history of breast cancer.(7-10) Among women with a prior history of breast cancer, there is no conclusive evidence demonstrating a reduction in either disease free or overall survival with ERT.(5,6) The benefits of ERT juxtaposed with the theoretical concerns of an increased risk of breast cancer recurrence among women with a prior history of carcinoma of the breast poses an obvious clinical dilemma.

The aim of this report is to broadly address several crucial questions pertinent to ERT in women with a prior history of breast cancer.

Does ERT lead to an increased risk of breast cancer in women without a prior history of breast cancer? The con-

troversial nature of this point is well demonstrated in a recent National Cancer Institute Clinical Facts Communication.⁽¹¹⁾ In one study (of 3,000 postmenopausal women all under age 55), the Centers for Disease Control reported no increased incidence of breast cancer associated with ERT, regardless of dose or duration of use. Yet, in another study supported by the National Cancer Institute, postmenopausal women who had taken estrogens for 20 years or longer had a 50 percent increased risk of developing breast cancer.

Despite these extremes in clinical observations, it is possible to formulate a greater understanding from a broader survey of the currently available data. A recent review of at least 30 epidemiologic studies published since 1974 designed to identify an association between hormone replacement therapy and breast cancer risk provides insight into the nature of this question.⁽⁷⁾ The following conclusions were proposed:

- Analyses of "ever" versus "never" users of ERT show no association with the risk of breast cancer.
- The duration of ERT affects risk with a relative risk of 1.5 after 15 or more years of use (U.S. studies).
- The increase in breast cancer risk after long durations of ERT is present for women with either a surgical or natural menopause.
- European studies exhibit higher risks after shorter durations (6-9 years) than do U.S. studies.
- The type of estrogen used and the addition of progestins to ERT may alter the breast cancer risk.

Most recently, Dupont et al⁽⁸⁾ conducted a meta-analysis of 28 publications of breast cancer risk and ERT in the medical literature from 1975 to 1989. This report utilized population-based relative risk estimates, whenever available, and presented the following conclusions:

- The relative risk of breast cancer associated with ERT was 1.07.
- Variation of the estimate of risks among the studies was greater than could be explained by chance alone.
- Women who took 0.625 mg/day or less of conjugated estrogens had a relative risk of breast cancer 1.08 times that of nonusers.
- Women who took 1.25 mg/d or more of conjugated estrogens had a relative risk of 2.0 or less in all studies.
- The relative risk of breast cancer from ERT among women with benign breast diseases was 1.16.

It was also concluded that the combined results provided strong evidence that menopausal therapy consisting of 0.625 mg/d or less of conjugated estrogens did not increase breast cancer risk. The finding of an increasing breast cancer risk with increasing duration of ERT could not be established in this study. It is worth mentioning that this review did not analyze the European data reporting a positive association with breast cancer risk and the duration of hormonal therapy.^(9,10)

Despite the published inconsistencies, it is possible to conclude that the type of estrogen used, the dose, and duration of therapy influence the subsequent development of breast cancer. At present, available U.S. data are inadequate in addressing the long-term effects of combined hormonal replacement therapy on the risk of breast cancer.⁽⁷⁾

Does ERT lead to an increased risk of recurrent disease among women with a prior history of breast cancer?

In addressing this question, it is helpful to consider the magnitude of the breast cancer population at potential risk. In the decade of the 1990's, more than 1.5 million women will be newly diagnosed and nearly 30 percent of these women will ultimately die from breast cancer.⁽¹²⁾ In 1991, it is estimated that 175,000 new cases of invasive breast cancer will be diagnosed among U.S. women, not including the estimated 15,000 new cases of carcinoma in situ of the female breast.⁽¹³⁾ With 51 years as the average age of menopause among U.S. women and 67 percent of initial diagnoses of breast cancer in women occurring after the age of 50 years, a sizable population exists in which to consider ERT for its beneficial effects.^(3,14) Thus, if an increased risk of developing recurrent breast cancer was to be demonstrated with ERT, then the population at risk would not be insignificant.

There are, however, no prospective clinical trials evaluating effects of ERT in women with a prior history of breast cancer on which to base any definitive conclusions regarding the risks or lack, thereof, in developing recurrent breast cancer. It is possible that this population might incur, at a minimum, the risks of ERT as seen in the nonbreast cancer population. However, there is an inherent bias in making this assumption. The design, ethics, and feasibility of conducting a clinical trial to answer this question would appear to be unlikely in the current clinical climate.

There are several theoretical concerns why ERT in

women with a history of breast cancer may be detrimental. First, breast cancer is known to be a hormonally-sensitive disease with estrogen receptor positivity found in approximately 50 percent of patients.(15) Second, there are anecdotal reports of true tumor progression after estrogen therapy, though this has been challenged as representing "tumor flare" as opposed to "true tumor progression."(6) Third, estrogens (and progestins) have a demonstrated effect on epithelial cell proliferation as measured by ³H-thymidine labeling studies in normal breast tissue.(16) Fourth, patients with a prior history of breast cancer are already at risk of developing a second primary breast cancer. Fifth, the use of ERT would be theoretically counter to the antiestrogen effects of tamoxifen which has demonstrated statistically significant improvements in disease free and/or overall survivals in women with adjuvantly-treated node positive and negative breast cancer.(17,18) Sixth, oophorectomy performed at an early age confers a decreased risk of subsequently developing breast cancer.(19) Taken together, the theoretical arguments why ERT might worsen the outcome in women with a prior history of breast cancer are daunting, but to date, remain unproven.

There is indirect evidence supporting the notion that estrogen may result in an increased risk of breast cancer recurrence from multiple studies of obesity in women with breast cancer.(20-24) These studies have shown that the adverse effect of obesity in postmenopausal women persists after correction for clinical stage, extent of surgery, and lymph node status.(20,21) Statistically significant reductions in breast cancer survival among premenopausal women have been attributed to obesity in at least three trials encompassing 1,117 women after adjustment for age and stage or nodal status.(22,24) As summarized by Spicer et al,(5) obesity may be an independent prognostic factor for breast cancer recurrence with a relative risk of 1.6. While obesity is associated with increased circulating levels of estrogens and unbound estradiol, it is not definitively established that the effect of obesity on breast cancer recurrence is an estrogen effect.(5) The reported data does raise serious concerns that ERT may be detrimental in a woman with a history of breast cancer.

Is it possible to identify a "low-risk" breast cancer population in whom ERT may be considered?

The most reasonable group of women in which to ask this question would be those with carcinoma in situ (lobular and ductal) and early stage, node-negative women with invasive carcinoma of the breast.

For women with lobular carcinoma in situ (LCIS) who have undergone bilateral mastectomies for the primary treatment of their disease, long-term cure approaches 100 percent.(23) Unfortunately, there are no data evaluating the risks and benefits of ERT in these patients, although this group may have the greatest chance of long-term cure. Women with LCIS who have elected to retain their breasts

after diagnosis represents a different problem. These patients have an 18-69 percent chance of bilateral LCIS, a 56-80 percent chance of unilateral multifocal disease, a 0-19 percent chance of clinically occult invasive disease, and a 22 percent and 15 percent chance of developing invasive breast carcinoma in the ipsilateral and contralateral breast, respectively, at 20 years from diagnosis.(25,26)

A similar dilemma for the use of ERT exists in patients with ductal carcinoma in situ (DCIS). Considered as a group, total mastectomy for DCIS confers a 95 percent or greater chance of cure.(25) Careful sectioning of mastectomy specimens from these patients disclose multicentric disease in 35 percent and occult invasive disease in 0-46 percent.(27,28) The cumulative risk of contralateral breast cancer 20 years after initial diagnosis has been reported to be 12.5 percent.(27,29) Occult axillary lymph node involvement has been reported in 1-2 percent of patients with DCIS.(25) In light of the concept that LCIS and DCIS serve as markers for breasts at risk of developing invasive disease, the routine administration of ERT can not be recommended, despite the absence of evidence to the contrary.

A third group in which to ask this question includes women with stage I (tumor size 2 cm or less; negative axillary lymph nodes) invasive carcinoma of the breast. This population is heterogenous in terms of risk for recurrence and survival. As a group, 20 percent will develop recurrent breast carcinoma within 5 years from initial diagnosis.(30) Those with primary tumors less than 1 centimeter have reported survivals of 90 percent at 10 years.(12) Prognostic factors for identifying women with stage I disease with the greatest potential for long-term cure are rapidly evolving.(12) At present, it is not possible to define a subset of women with stage I breast carcinoma whose risk of recurrence is "so low" in whom the demonstrated benefits of ERT outweigh the theoretical risks. The prudent physician should consider that there are published absolute and relative contraindications to the use of ERT in women with a prior history of breast cancer.(3,6)

Are there alternatives to the use of ERT in women with a history of breast cancer?

The following discussion presents alternative treatments referable to the management of climacteric symptoms, amelioration of urogenital atrophy, reduction in cardiovascular mortality, and the prevention and treatment of osteoporosis.

The results of estrogen deprivation on vasomotor symptoms and urogenital atrophy are well described.(3,31) Hot flashes/flushes occur in 75-85 percent perimenopausal women and persist for 1 year in 80 percent and 5-10 years in 45 percent of these women.(3) While ERT can virtually eliminate vasomotor symptoms, a challenging problem remains for those women in whom estrogen can not be administered.

Adjunctive measures such as progestational agents, clonidine, alpramethyldopa, and combinations of phenobarbital and belladonna have been proposed for the treatment of hot flashes with varying degrees of success.(3,31) Clonidine in doses of 50-150 micrograms per day has been effective in reducing the number of hot flashes compared to placebo with mild xerostomia as the predominant side effect.(32) There is no evidence that tamoxifen is beneficial in reducing vasomotor symptoms.(5,18) The use of a vaginal lubricant may be helpful in relieving dyspareunia associated with vaginal atrophy. Supportive measures for stress incontinence and surgical procedures strengthening the pelvic floor may be considered. Clearly, more effective management options are needed for these vexing problems.

The beneficial effects of estrogen in reducing cardiovascular mortality have been reviewed.(1,2,33) In women with breast cancer in whom ERT is not an option, continued efforts to modify and effectively treat the well recognized risk factors for coronary heart disease and cerebrovascular disease should be pursued.

There is emerging evidence that tamoxifen, an estrogen agonist-antagonist, exerts a favorable effect on the lipid profile of postmenopausal women with early stage breast cancer.(34) In this 2-year, randomized, double-blind, placebo-controlled trial of 140 women with node-negative breast cancer, total blood cholesterol and LDL-cholesterol were reduced on the average by 12 percent and 20 percent, respectively, with a presumed corresponding reduction in the incidence of coronary heart disease.

It is anticipated that a formal feasibility study of tamoxifen for the primary prevention of breast cancer and reducing the risk of coronary heart disease will emerge as an extension of this trial.(35) If these results are positive, it is possible that within the next decade a viable option to ERT in reducing cardiovascular mortality may be achieved.

Osteoporosis resulting from estrogen deprivation represents a major health care problem among postmenopausal women. Health care costs in 1986 exceeded 5 billion dollars in the treatment of clinical osteoporosis.(36) In women sustaining osteoporotic hip fractures, 15 percent will die within 3 months as a result of medical complications.(37) With epidemiologic data suggesting that ERT given for at least 5 years early in the climacteric period reduces subsequent hip and Colles' fractures by about 50 percent and vertebral fractures by 90 percent,(38) the avoidance of ERT in peri/postmenopausal women with prior breast cancer represents a dilemma. While unproven, it is possible that a brief period of estrogen supplementation in the climacteric period may help forestall the latent complications of osteoporosis without increasing the risk for breast cancer recurrence. For reasons already described, this may have the potential of inducing an adverse outcome for the patient and a medicolegal problem for the physician.

Recommendations for the prophylaxis and treatment of osteoporosis have been previously reviewed.(38,39) The recognition of risk factors and the treatment of conditions known to cause osteoporosis (secondary) are applicable to postmenopausal women with or without a history of breast cancer.

The use of calcitonin and diphosphonates have been shown to prevent trabecular bone loss during the first years of menopause and represent an alternative to ERT.(38) While high calcium intake will not substitute for estrogen in reducing accelerated bone loss during the climacteric period, 1,500 mg of calcium daily may be recommended.(39) The treatment of vitamin D deficiency as well as the modification of environmental hazards and treatment regimens that may lead to falling are particularly important among the elderly for fracture prevention.(38) The avoidance of excessive exposure to glucocorticoids, minimizing immobilization, and the encouragement of reasonable exercise represents prudent adjunctive measures.

There have been recent reports suggesting that tamoxifen may increase bone mineral density as measured by dual photon absorption.(40,41) It is possible that this agent may be as effective as estrogen in preventing bone loss in postmenopausal women with a history of breast cancer. However, it remains to be proven whether the risk of fractures will be reduced in women taking tamoxifen as has been shown with ERT.(1,3,36)

Conclusions

Despite the paucity of evidence linking ERT to an increased risk of breast cancer recurrence, there is no data to suggest that a woman's risk is decreased by the administration of exogenous estrogen. The association of ERT with breast cancer is less controversial among postmenopausal women without a prior history of breast cancer. In this setting, ERT may be associated with an increased risk of breast cancer in the range of 1.5 to 2.0 with moderate doses of conjugated estrogens used for durations of 10 to 20 years. In women with a prior history of breast cancer, the management of vasomotor symptoms may be attempted with nonhormonal approaches. Progestin therapies are effective in alleviating many of the vasomotor symptoms of menopause, but there is insufficient data to conclude this is safer than ERT in patients with a prior history of breast cancer. Measures taken to reduce cardiovascular mortality centers on changes in at-risk lifestyles and the medical management of risk factors. The prevention or treatment of osteoporosis in women with a prior history of breast cancer includes calcium supplementation, mild to moderate exercise, avoidance of immobilization, and the consideration of calcitonin or diphosphonates and the management of secondary risk factors. Whether tamoxifen will ultimately demonstrate a reduction in cardiovascular mortality and fracture rates among postmenopausal women awaits future investigations.

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Navy Medicine 1941

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*P*earl Harbor was a wake up call for a nation undecided, vacillating, hanging on the precipice—preparing for war—hoping for peace. It all changed in an instant on 7 Dec 1941. This was a conflict different from any war America had ever fought—bond and rubber drives, ration stamps, blackouts, victory gardens—every single facet of American life was in some way connected to winning the war. Pearl Harbor united the American people as no single event had before or since.

Navy medicine was there from the beginning, expanding its services to accommodate the Navy and Marine Corps in a global effort. At the time of the Pearl Harbor attack, there were only 18 continental hospitals, 3 extra-continental hospitals, 2 mobile hospitals, and 2 hospital ships in commission. These facilities were manned by approximately 13,000 persons—1,957 doctors, 511 dentists, 524 nurses, 195 hospital corps officers, and 10,547 hospital corpsmen. By 1945, the ranks had swollen to about 169,225 personnel—14,191 doctors, 7,012 dentists, 10,968 nurses, 3,429 Hospital Corps officers, 132,500 hospital corpsmen, and 1,125 WAVES.(1) They were assigned to 56 continental hospitals, 12 fleet hospitals, 16 base hospitals, 14 convalescent hospitals, 12 hospital ships, 5 special augmented hospitals, and many dispensaries.

Throughout World War II's 50th anniversary years, Navy Medicine will showcase the personnel and events that contributed to final victory by featuring a chronology of Navy medical history in each issue.

Four days after Germany attacked Poland on 1 Sept 1939, President Roosevelt issued a neutrality proclamation. Immediately, he took steps not only to ensure the nation's defense but also to prepare for possible involvement in the war. In response, RADM Ross T. McIntire, Navy Surgeon General, began preparing the Medical Department for its expected role in any conflict. That same week, McIntire met with 11 BUMED department heads to assess preparedness. As a result of the meeting, department heads prepared and submitted plans to the Surgeon General that became components of the "overall plan for medical department activity in time of emergency."(2)

Navy Medicine Prepares

The problems confronting the Medical Department were many, severe, and immediate. On the same day Roosevelt issued the neutrality proclamation, he ordered the Navy to set up a neutrality patrol to "report and track any belligerent air, surface, or underwater naval forces approaching [the] Atlantic coasts of the United States or the West Indies."(3) Operations of the neutrality patrol lead to an increase in patients at medical shore activities along the Atlantic and Gulf of Mexico coasts as patrol staffs now began transferring more sick and injured to dispensaries and hospitals.(4)

On 8 Sept 1939, just 3 days after the patrol had been established, Roosevelt declared a "limited national emergency" and called for an increase in the Armed Forces enlisted strength. This action increased the Navy force from

110,813 to 145,000 and the Marine Corps from 18,325 to 25,000. In addition, the President authorized the recall of Navy personnel on retired lists.(5)

In October 1940, approximately 16,400,000 men registered for the draft under the Selective Training and Service Act, and the Secretary of the Navy also placed the "Organized Naval Reserves on short notice for call to active duty."(6) With large numbers of recruits reporting to training centers, medical facilities like the USNHs (U.S. Naval Hospitals) Great Lakes, IL; Newport, RI; and Parris Island, SC, were rapidly filling to capacity. In an annual sanitary report submitted to BUMED in December 1940 from USNH Newport, hospital officials reported that on two occasions all but two hospital beds had been occupied.(7) Not only were these medical facilities lacking space, they were also in dire need of modern equipment and buildings.

Other Navy hospitals, not in desperate need of beds, required renovation. Some hospitals, like USNH Chelsea, MA, and USNH Brooklyn, NY, were partially housed in buildings that dated back to World War I.

Despite the need for renovation and additional equipment, the main concern was a lack of space for special patients—officers and convalescent patients. BUMED therefore began a program of expansion, renovation, and construction. The first priority was those activities in training center regions. Within 2 years, USNH Great Lakes acquired two new dispensaries. The first, a newly built, two-story

A wounded sailor is carried to safety.

building, was commissioned on 12 May 1940 and the second was completed on 21 May 1941. Similarly, the U.S. Marine Base, Quantico, VA, dispensary gained new corpsmen and nurses' living quarters, becoming USNH Quantico on 1 July 1941.(8)

In some instances, new hospitals replaced obsolescent ones. In 1940, construction began on a new facility at USNH Charleston, SC, on the site of the World War I hospital.(9) As existing Navy activities expanded and new ones developed, Navy medical facilities followed suit. Prior to Pearl Harbor, naval air stations, like the one at Pensacola, FL, (then called an aeronautics station), expanded rapidly as strides were made in aviation and as participation in World War II became more likely. A new hospital in Pensacola, FL, was dedicated on 15 Feb 1941.(10) USNH Jacksonville, FL, and USNH Corpus Christi, TX, were both commissioned on 1 July 1941 to service naval air stations that had been established in both areas.

Navy Medicine West

Because the United States had fought all its previous wars primarily in the Atlantic theater, most of the hospitals in commission by the close of 1941 were located on the east coast. Prior to Pearl Harbor, there were three Navy hospitals on the west coast: Puget Sound Navy Yard, Bremerton, WA; Mare Island, CA; and San Diego, CA. Apart from these, there were but three other Navy hospitals in the Pacific region: Pearl Harbor, HI; Canacao in the Philippines; and Guam, all U.S. island possessions.

In May 1940, President Roosevelt ordered the Pacific Fleet to remain in "Hawaiian waters" indefinitely. This strategic measure posed a problem for these few facilities. By early 1941, they were "experiencing some difficulty" increasing their bed capacity at a rate commensurate with incoming patients. In March 1941, USNHs San Diego, Mare Island, Puget Sound Navy Yard, and Pearl Harbor, re-



ported a combined patient census of 3,015 with a combined bed total of 2,690. In addition, officials at San Diego reported that after utilizing all available hospital space, no hospital facilities were available for 230 other patients in the San Diego area. Pearl Harbor officials also reported that their facility was overwhelmed. Similarly, the hospitals at Mare Island and Puget Sound Navy Yard were "taxed to the utmost."(11)

The problems plaguing the west coast/Pacific region were not ignored. Construction of new hospitals and additional facilities began immediately. In 1940, USNH San Diego, received two new additional buildings for its medical department facilities. The first building, completed in April, raised the facility's bed capacity from 40 to 96; and the second, completed in June, served as a dental clinic that accommodated 20 dental units and included a waiting room. Subsequently, in 1941, San Diego's bed capacity reached 275 after BUMED procured two nearby barracks equipped with double bunks. The Navy Medical Department's policy of procuring property from other service branches and government agencies as well as from the private sector would become a principal element in the Medical Department's struggle to accommodate the sick and wounded.(12)

Mobile Hospitals

Another problem associated with the west coast/Pacific region was that of constructing facilities that would meet the needs of the rapidly expanding and mobilizing fleet and Marine Corps forces operating in the Pacific. In certain areas, it was nearly impossible to construct even temporary hospitals at the rate the fleet moved around. Thus, Medical Department planners sought to create a facility that would be as mobile as deploying large military forces but would offer care comparable to regular naval hospitals. Only two types of installations came close to fitting this objective—hospital ships and field hospitals. Hospital ships had facilities comparable to regular naval hospitals but, like the field hospitals, their primary purpose was to provide intermediate care and definitive treatment in between evacuation from the first aid and battle stations to stationary naval hospitals. Neither was adapted to serve fleet and ground forces for lengthy periods of time.(13)

As early as 1939, long before many of the problems arose in the west coast/Pacific region, the Surgeon General and the BUMED Planning Division began contemplating the construction of some form of "prefabricated, transportable general hospital." (14) Consequently, in 1940, BUMED set up U.S. Naval Mobile Hospital No.



Mobile Base Hospital No. 2 had been set up on Aiea Heights less than 3 weeks when the Japanese struck. Its personnel cared for 110 victims of the attack.

1 at the U.S. Naval Station, Guantanamo Bay, Cuba, as an experimental unit. As with any experiment, this one, too, would be improved through trial and error. Many problems associated with the packaging, handling, loading, and unloading of crates would be corrected and would not plague U.S. Naval Mobile Hospital No. 2.

Navy Medicine in Progress

As 1941 came to a close, several hospitals were being constructed on both coasts, including USNH Bethesda, MD, the replacement for the USNH Washington, DC; USNH Treasure Island, San Francisco, CA, intended as a subordinate command to the U.S. Naval Station; USNH Coco Solo and USNH Balboa, both in the Canal Zone; and the USNH Long Beach, CA, for which the first slab of concrete was poured the day before the Pearl Harbor raid. In addition, a hospital that would replace the overcrowded USNH Pearl Harbor, was underway at Aiea Heights, HI.

Much progress was being made in aviation medicine and in November 1939, the U.S. Naval School of Aviation Medicine opened. Prior to its establishment, flight surgeons received training from the Army Air Corps. On 4 Dec 1941, 153 Reserve medical officers graduated as aviation medical examiners and 54 Regular medical officers became flight surgeons.

In medical technique and treatment, progress had been made in chemother-

apy, immunization, and in using whole blood and plasma in transfusions. Atabrine had already proven to be an effective treatment against malaria in the 1930's and sulfa drugs were now commonly used for treating war wounds and gonorrhea. Between March 1940 and December 1941, the Navy and Army jointly developed "practical methods for collecting, processing, storing and packaging blood." (15) By July 1941, the Naval Medical School was issuing units of citrated plasma to continental hospitals.

Between June 1939 and June 1941, Navy hospitals experienced an increase of about 87 percent or from 4,124 to 7,723 patients. During that same period, personnel in the Medical Corps increased from 841 to 1,957; in the Dental Corps from 255 to 511; in the Hospital Corps from 4,267 to 10,545; and in the Nurse Corps from 439 to 524. (16)

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Navy Medicine at Pearl Harbor

Pearl Harbor. Sneak attack. Treachery. Day of infamy. The single, tragic, galvanizing event that plunged the United States into World War II. In the 50 years since Japanese planes swarmed out of a balmy Sunday morning sky and nearly obliterated the Pacific Fleet, it seems that everything that could be said about 7 Dec 1941 has been said—and debated. Almost before the smoke had cleared, the search for answers began and continued even after final victory. A congressional investigation seeking the truth heaped up over 40 volumes of testimony, shortened careers, and ensured by its quarrelsome deliberations that the controversy would live on.

Grand anniversaries of singular events, for whatever they are worth, do focus and fine tune our attention. Veterans, survivors, and members of the "World War II generation" recall

and reminisce; historians reexamine and interpret the collective evidence—and debate.

What cannot be disputed is that Pearl Harbor was one of the greatest setbacks in U.S. military history. For the Navy, 7 Dec 1941 represents its greatest disaster. In less than 3 hours the pride of the Pacific Fleet had been turned into smoldering hulks of twisted metal. Even before the last Japanese aircraft broke off the attack, what they had wrought was truly catastrophic. Capital ships that once projected U.S. might and prestige—Arizona, Utah, Pennsylvania, California, West Virginia, Maryland, Oklahoma, Nevada—either lay on the bottom at their moorings or were too crippled to be of any immediate use.

Modern warfare in the form of aerial torpedoes, armor piercing bombs, and machine guns took an even greater toll in human life. The



Navy alone lost about three times as many men—2,008—in this one attack as it lost in the Spanish-American War and World War I combined.*

Yet the badly burned and wounded survivors found care and comfort. Navy medicine was already on the scene represented by a naval hospital, a partially assembled base hospital, and USS Solace, the newest hospital ship in the fleet. Heroic round-the-clock efforts to save lives by the men and women who manned these facilities

*The day was very costly for Navy medicine. Two medical officers and two dental officers lost their lives. Twenty-five corpsmen were killed in action, 13 on USS Arizona alone when a bomb hit the sick bay.



Photos from the BUMED Archives

ties began minutes after the first Japanese bomb dropped and never waned until the last casualty was either returned to duty or evacuated to a stateside hospital for further care.

The Noise of an Aeroplane

Navy nurse Ann Davidson had just assumed the duty in the sick officer's quarters at the Naval Hospital.** It was nearly 0800. Suddenly the build-

ing shook as if whacked by the hand of an unseen giant. Clouds of black, oily smoke roiled skyward over Ford Island as strange aircraft wearing the rising sun insignia swooped low across the hospital grounds.

At the same instant, LT Oran W. Chenault, MC, was examining a patient on Ward J. The "noise of an aeroplane in a power dive" caught his attention. He heard a loud explosion.

This aerial view of Pearl Harbor shows Hospital Point and the Naval Hospital in the foreground. Ford Island is just across the main channel to the left.

**Naval Hospital Pearl Harbor, built in 1915, was located on the waterfront in the western section of the navy yard facing the main channel on what became known as Hospital Point. Since its construction in 1915, the surrounding yard complex had expanded to suit the needs of the fleet. By the late 1930's, high radio towers

loomed over the hospital; beside it was one of the large oil tank farms that supplied fuel to the fleet. On the eve of World War II, Naval Hospital Pearl Harbor provided the only hospital facilities for the Pacific Fleet away from the mainland, except for the smaller facilities at Guam, Samoa, and the Philippines.



Chief Nurse, Grace Lally, poses with Solace's Commanding Officer, CAPT Benjamin Perlman (left) and Senior Medical Officer, CAPT Harold L. Jensen, MC, shortly before war broke out. Opposite page: USS Solace (AH-5) the Navy's newest hospital ship in 1941.

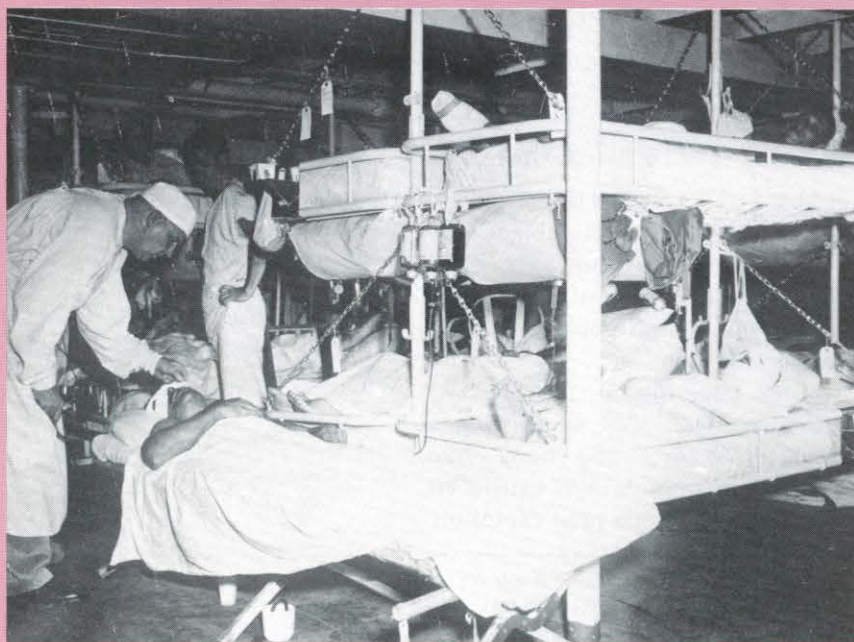
Dr. Chenault instinctively raced for the lanai, a Hawaiian-style screened porch, where he observed "several Japanese aeroplanes . . . flying just over the treetops to and from Ford Island." Within minutes there were orders to man the stations for air attack, ready the ambulances and fire fighting equipment, and release patients from the brig and lock ward. All operating rooms and crews were to be put in readiness.(1)

Caught totally off guard, American defenders manning anti-aircraft guns were beginning to strike back. A crippled "Val" dive bomber headed straight for the front of the hospital. Onlookers gasped as it suddenly veered left, demolished the maids' quarters, and then struck the corner of the laboratory building before coming to rest between it and the chief petty officers' quarters. Drenched with aviation gasoline, both structures burst into flames. Hospital firefighters extinguished the blaze and pulled the two fatally injured Japanese aviators from the wreckage.

CAPT Reynolds Hayden, Naval Hospital Pearl Harbor's commanding officer, was in the shower when he heard the loud, angry, hornetlike whine of aircraft engines. He was incredulous. "We looked out the window just as three planes went by the second floor of my quarters, only about seventy-five feet away. I could see the features of the men in them. . . ." (2)

Hayden, his executive officer, and other hospital staff living on the reservation reported for duty immediately. Others were summoned by telephone. By 0915 the hospital was almost fully manned as casualties began streaming in, brought by ambulances, military and civilian trucks, private cars, and delivery wagons.

As medical officers arrived, they deployed to several dressing stations. Four teams began working in the main operating suite. Staff members set up a receiving station for minor injuries in the original but now vacant nurses' quarters. Many dead were brought in with the wounded, requiring the hasty

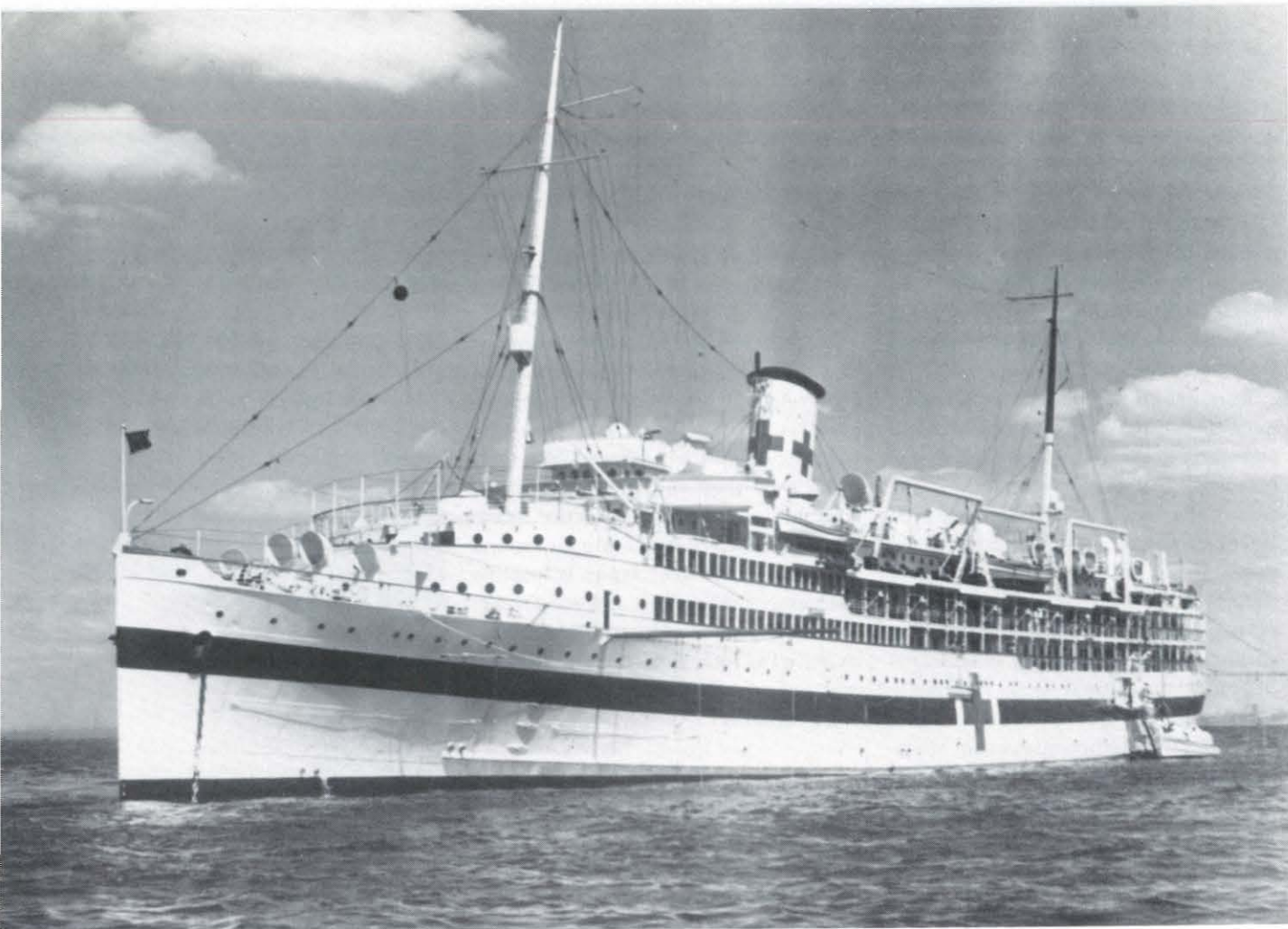


A Solace medical officer examines one of the many burn victims pulled from the water.

Trail by Fire

The Pearl Harbor raid gave Americans a taste of what Europeans and Asians had already experienced during 2 years of total war. American personnel suffered every type of injury—multiple compound fractures, traumatic amputations, and gunshot and shrapnel wounds.

Some 60 percent of all patients had clinically significant burn injuries. Few, if any, of the Navy physicians and nurses had ever seen such extensive burns. This was not surprising considering the shipboard environment and the nature of the weapons. Explosions of powder, bombs, torpedoes, and projectiles caused flash burns, producing mainly first and second degree injuries. Men unlucky enough to have been caught without under-



shirts or trousers suffered most. Those wearing shorts and no shirts were a mass of burns—backs, chests, and abdomens—all except their thighs . . . while those who were wearing shirts and trousers escaped with singed hair and blistered hands and faces.(1) The obvious lesson was that even an undershirt and shorts provided a high degree of protection from flash burns. Future battle preparations would require antirash clothing, or long-sleeved jumpers and slacks. Shorts would be prohibited when an attack was imminent.

Escaping steam, scalding water, electrical fires, and the ignition of gasoline and fuel oil also claimed many victims. These most often resulted in first and second degree injuries.

Burns were classified into first degree (erythema), second degree

(vesication), third degree (destruction of epidermis), and fourth degree (involving subcutaneous fat and deeper tissues).(2) Although flash burns were seldom fourth degree, electrical burns were almost always in this class. Steam or hot water usually resulted in second, third, or fourth degree injuries.

Hand burns frequently occurred as many victims attempted to beat out the flames from burning clothing, slid down ropes as they abandoned ship, or clasped searing ladder rails.

Treatment of shock due to the loss of blood volume was the main concern. All seriously burned patients received plasma, either the dry variety that was reconstituted with sterile water, or the wet type the Civilian Plasma Bank in Honolulu donated.

To prevent further loss of plasma

through burned flesh, stimulating the formation of an eschar, or scab over burn wounds, was also a priority. Tannic acid jelly or solution, gentian violet, and triple dye with or without silver nitrate were used to stimulate this so-called "tanning" process.

After shock, infection was the leading cause of death. Medical staff working with burn patients scrubbed frequently and used sterile gowns, gloves, and instruments for debriding and dressing. They used bacteriostatic sulfathiazole ointment extensively and applied saline and sulfanilamide solutions to dressings. Although penicillin had already been developed, this miracle drug was not yet available.

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conversion of the basements of the nurses' old quarters and the laboratory into temporary morgues. The remains of the two Japanese fliers were among the first to be deposited there.

Personnel evacuated ambulatory patients from the hospital wards and transferred them to two old frame buildings and five hospital tents in the rear of the hospital, the regular wards being left available for battle casualties.

As the second wave of enemy aircraft loosed their deadly missiles, shrapnel particles fell like confetti.(3) "Though occasional shell fragments and machine-gun bullets zipped through [the] temporary ward building, all hands were so busy they had no time to think of themselves. Fortunately, nobody was injured."(4)

USS *Solace* (AH-5), anchored north of Ford Island, unwittingly drew a ringside seat. Chief Nurse Grace Lally glanced out her stateroom porthole just as a plane spitting flame from the leading edges of its wings gunned down a sailor peacefully fishing from a nearby ship.(5) Navy nurse Anna Danyo lay sound asleep. An explosion nearly threw the 29-year-old woman from her bunk. "A ship's boiler must have blown up!" she thought as she hurried to the porthole.(6) Across the water, she saw *Arizona* in flames. Simultaneously, fellow nurse Ruth Cohen witnessed a sight she would never forget. "It was as though a million Roman candles had suddenly been set off on the gray battleship which I knew was the *Arizona*—flaming pinwheels, unimaginable, starry patterns of light."(7)

As general quarters blared over the loudspeaker, a group of *Solace's* medical officers "saw the *Arizona* burning, and two or three of the other battleships listing badly. Japanese planes were flying all around and over the ship, dropping bombs between us and the *Dobbin* [AD-3]."(8) Just then, those ships that could sprang into

action with their anti-aircraft guns, catching *Solace* in a dangerous cross fire.

At 0850 the hospital ship got underway and reanchored across the harbor at a relatively safer mooring. Whenever the medical officers took a rare breather from their labors, they marveled how their ship seemed immune from damage, especially since Japanese planes were swarming all around and above her. Was Japan respecting the vessel's white hull and red crosses in deference to the Hague Convention, or were the attackers too intent on not wasting a single bomb or torpedo on a noncombatant?

A Great White Lily

Less than 15 minutes after the raid began, *Solace* had lowered her boats to pick up men floundering in the oily water. One of the rescuers remembered what happened next.

We felt helpless as we tried to maneuver slowly among the swimmers, hoping to keep the flames away from them with our propeller wash. Some of the bodies in the water were beyond help and the heavy coating of fuel oil on the surface made swimming almost impossible for others.(9)

Within 20 minutes of the first bombs, all hands turned to. Corpsmen set up an emergency ward of 50 additional bunks in the officers' lounge and broke out supplies of bandages, dressings, and plasma. As casualties began arriving, crewmen hoisted them from the small boats to the gangway. Once they were aboard, a physician triaged them and morphine was administered even as the nurse beside him wrote casualty tags.(10)

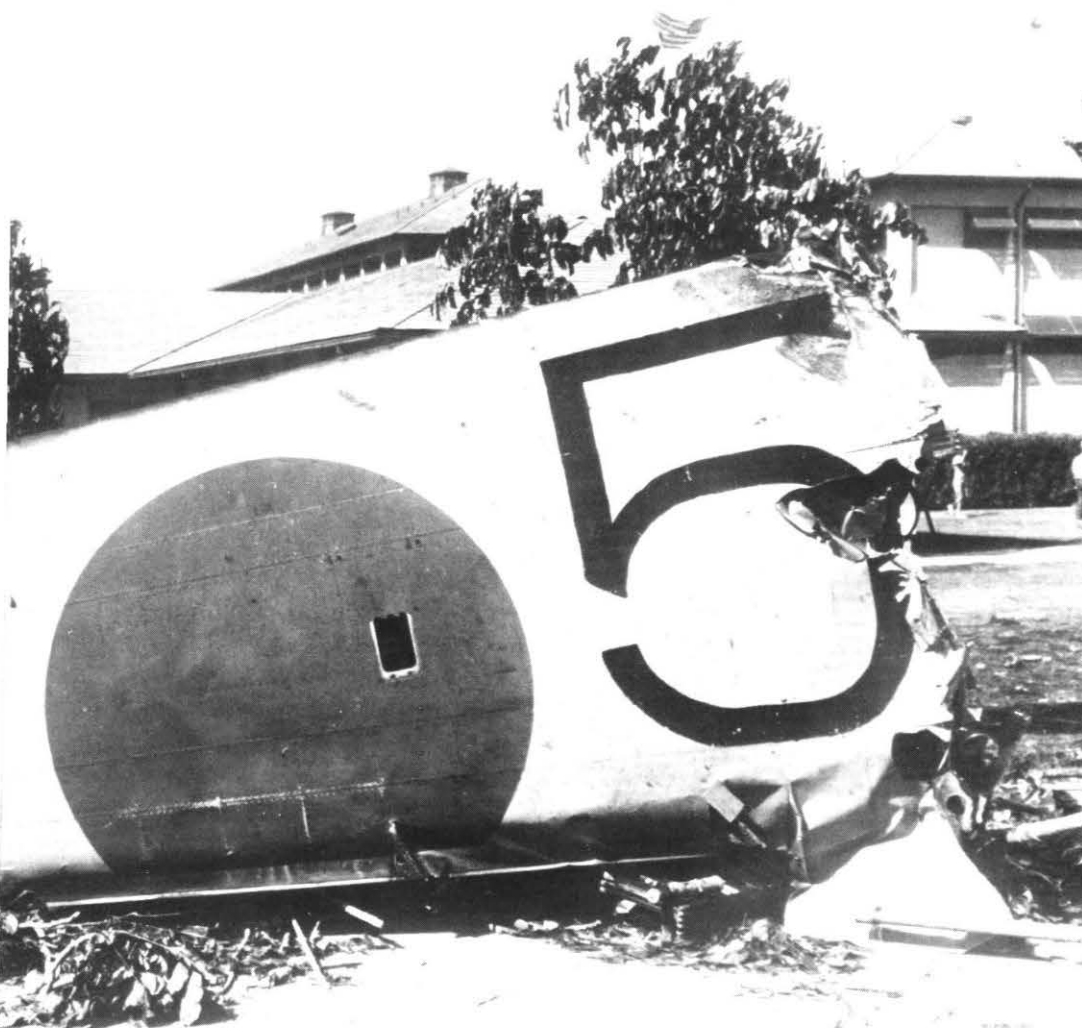
A crewman from the mortally wounded *Arizona* saw the drama from another perspective. After the magazine explosion that sealed the battleship's fate, many survivors took refuge on the quarterdeck which remained above water. Seaman Second Class Oree C. Weller joined some 50 other



crewmen, many of whom were already badly burned.

Before long a white motor launch with the name *Solace* on the bow pulled up to the starboard side and from it corpsmen with emergency kits jumped on deck to attend to those needing help. . . . Despite an advancing wall of flame, the coxswain of the launch kept it alongside the hull until all who needed immediate medical attention could be taken aboard. . . .(11)

Weller recalled how he and his shipmates had previously seen *Solace* as "a great white lily sitting serenely in the harbor. . . . Now she looked more like a welcome beacon and a haven for our wounded, and I realized her importance."(12)



One wing of the Japanese "Val" dive bomber where it came to rest next to the Naval Hospital tennis court. Both crewmen were already dead when hospital staff pulled them from the wreckage.

When the second wave of Japanese aircraft began its dirty work, there seemed no end to the casualties. "Men came burned and blackened . . . with fuel oil matting together scraggly clumps of singed hair, clothing charred or completely gone, hands and forearms denuded of flesh, dark, and claw-like." (13) It was difficult to determine where the black coating ended and the charred flesh began. "Many were so seriously burned," recalled Chief Surgeon CAPT George Eckert, "as to be unrecognizable. Those who were conscious tried to mumble their names. But no one whimpered." (14)

Forty-seven percent of those

brought to the Naval Hospital were burned; many were unconscious. Other patients had shrapnel and machine-gun wounds, and almost all were in shock. Medical procedure was the same on *Solace* and at the Naval Hospital. Doctors, nurses, and corpsmen carefully cut clothing from the injured men, applied tannic acid to the burns, and administered plasma to treat shock. Cleaning off the oil would have to wait. Patients with severe wounds, compound fractures, or any injury requiring surgery, went immediately to the operating room.

Although the Japanese broke off the raid about 1000, no one could be cer-

tain they would not return. In fact, at 2110, the air raid alarm and general quarters sounded again on the hospital ship, when witnesses saw planes with landing lights heading for the naval air station on Ford Island. Nervous anti-aircraft gunners let loose with everything they had, and *Solace* personnel saw at least one plane fall in flames over Pearl City. Unfortunately, they later learned, it was one of ours.

Mobile Base Hospital No. 2

Mobile Base Hospital No. 2 had arrived at Pearl Harbor on 25 Nov, but had not yet been completely erected on Aiea Heights north of the harbor.

Pearl Harbor on the morning of 7 Dec 1941. Arrows indicate locations of the Naval Hospital and Solace.

Nevertheless, the efficient packing and marking of supplies and equipment enabled corpsmen to find needed items and treat 110 patients during and after the raid. Another temporary field hospital, staffed by medical officers and equipped with material taken from ships damaged during the raid, was set up in the officers' club at the navy yard.⁽¹⁵⁾

Aftermath

Some 452 battle casualties were admitted to the hospital during the day. Many others were treated and immediately returned to duty; their attendance was never recorded. Following the air raid, 93 additional casualties arrived at the hospital from temporary first aid stations and from several plantation hospitals in the Pearl Harbor vicinity. By midnight on 7 Dec, the patient census had reached 960.

For 3 days following the attack, all hands worked a 24-hour shift at the hospital catching sleep when they could. Four teams labored in each operating room, two teams at a time in relays. For the next 2 weeks the entire staff pulled duty in watches around the clock.

Burn victims required constant attention. Patients who could not be covered by blankets were suspended in special heat cradles and warmed by electric bulbs. *Solace* personnel filled scavenged stainless steel buckets with tannic acid crystals and water, then distributed the buckets to the operating rooms and wards, where the solution was applied to burn dressings (see sidebar). At the hospital, nurses and corpsmen continuously sprayed burn dressings with tannic acid, gentian violet, and triple dye, applied with Flit guns emptied of their insecticide and then sterilized.⁽¹⁶⁾

Even as they toiled, there were whispers of a full-fledged Japanese landing on the other side of Oahu. The windows of the ORs and one medication room had been painted black. Throughout the wards the nurses worked with blue paper over their flashlights. In the wards with burn

patients, corpsmen pinned blankets across the windows to shut out the light.⁽¹⁷⁾ But even the best efforts were not enough. Deaths were frequent among the burn victims. Of those who clung to life, nearly half were serious cases with deep burns. Their prognosis was poor.

Lessons of War

If Pearl Harbor was a rude awakening to an unprepared nation, it was also a live fire test of the Navy's combat medical system. Confronted with mass casualties, Navy medicine came through its first surprise encounter with World War II amazingly well. Hospital and hospital ship personnel performed their duties conscientiously and diligently under fire and treated far more patients than anyone would have thought possible.

Nevertheless, many practical lessons were learned such as training ships' companies in first aid, and distributing first aid supplies throughout the ship. Serious fires completely isolated entire ships' sections and local supplies were the only ones available. Dispersing medical personnel was another hard lesson. Henceforth, men would be forbidden from congregating or sleeping in the sick bay. Because many individuals were caught below decks without light, or were overcome by thick, impenetrable smoke and gases, in the future, flashlights and gas masks would be carried by medical personnel at all times.

CAPT E.A.M. Gendreau, Fleet Medical Officer, U.S. Pacific Fleet, perhaps understated the day's significance when he said, "Our experiences were definitely realistic."⁽¹⁸⁾ What Pearl Harbor really symbolized was a terrifying and sobering initiation for the physicians, dentists, nurses, and hospital corpsmen who had just begun the long, bloody journey to final victory. —JKH

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The Ahwahnee Hotel, then owned by the Yosemite Park and Curry Company, was leased to the government and commissioned as the U.S. Naval Convalescent Hospital in June 1943.



National Park Service

BUMED'S World War II "Resorts"

Jennifer Mitchum



BUMED Archives



BUMED Archives

After being pounded day and night from air and sea, enemy positions should have been silenced but they were not. As leather-necks from the 1st Battalion, 25th Regiment hit the beach on Saipan, they knew they were in trouble. The Japanese, who were not supposed to be there, crawled from their protected hideouts and hit the invaders with everything they had. From behind splintered palm logs, defenders fired machine guns and mortars at marines who were now huddled flat against the ground. An LVT (landing vehicle, tracked), that had accompanied the 1st, hastily retreated without unloading ammunition, mortars, or machine guns, leaving the men totally defenseless. Pinned down on the enfiladed beach, the marines awaited their fate.

Only after desperate strafing and bombing attacks did the Japanese yield ground, enabling the 1st to achieve its objective—Agingan Point. But the victory was a costly one for what seemed just a few hundred yards of sand.

Among the dead and wounded, scattered on the beach like so many dominoes, lay a 20-year-old corporal, moaning as a corpsman did his best to stem the blood gushing from his leg. That accomplished, two marine stretcher-bearers carried the man to a nearby rubber boat full of wounded. A dozen men, waste deep in water, pushed the boat across the coral shallow bottom to a landing craft, where the marines were first transferred to an LST (landing ship, tank) and then to a transport that sailed for Fleet Hospital No. 108 in Guadalcanal that morning.

Aboard the transport, hospital corpsmen administered plasma, a tetanus shot, and morphine to alleviate the corporal's pain. After undergoing orthopedic surgery for a compound fracture, he recuperated in Fleet Hospital No. 108 for a week. He was then airlifted to U.S. Naval Hospital (USNH) San Diego, CA, where he received more clinical treatment and began his rehabilitation.

With the passing of a few weeks, the patient's condition had improved only

BUMED Archives



Top left: At night, lights reveal the splendor of the U.S. Naval Convalescent Hospital Sun Valley, ID, formerly the Sun Valley Lodge and Challenger Inn. **Above:** A skier's view of the U.S. Naval Convalescent Hospital Sun Valley, ID. **Left:** Patients relax on the grounds of the U.S. Naval Convalescent Hospital Asheville, NC. This facility had been a mental sanitarium before being procured by the Navy.

minimally. His physical wounds were healing, but his psychological and emotional states seemed to be worsening. He sweated constantly, stared out the window for hours, and became unmanageable when therapists approached. Clearly, the patient required a new treatment plan.

A few days later, a medical officer informed him that he was being transferred to the U.S. Naval Convalescent Hospital (USNCH), Yosemite National Park, CA. The marine was frankly astonished to learn there was a hospital in a national park. He wasn't alone. Few Americans knew anything about those special hospitals commissioned during World War II to promote patient rehabilitation.

The concept behind the Navy's convalescent hospitals was simple. One of the major problems medical personnel faced during World War II was combat fatigue, the traumatic psychoneurotic reaction which occurred under wartime combat conditions causing intense stress. This condition is now known as post-traumatic stress

syndrome. The Navy believed combat fatigue hindered full recovery; therefore removing battered sailors and marines from the battlefield environment enhanced the likelihood for complete, rapid recovery. The convalescent hospital, with its resort atmosphere, was the antithesis of war and its horrors.

The following morning, the corporal departed for USNCH Yosemite. The drive to the hospital revealed the beautiful mountain scenery that has made Yosemite famous. When he entered the main hospital building, the former Ahwahnee Hotel, he was classified and assigned to a ward. That same afternoon, he began his "vacation" by fishing a local trout stream and bowling before retiring for the evening.

Early the next morning, while at the archery range, the patient learned that he could even take college courses while staying at the hospital. Having been due to enter college the fall he joined the Marine Corps, the rapidly recovering patient met with the educational services officer and signed up for both an English and a math class. After 4 weeks of rehabilitation, the corporal was discharged from Yosemite and returned to duty.

When the United States entered World War II in December 1941, the Navy Medical Department expanded to meet its new wartime role. At the time of the attack on Pearl Harbor, the Medical Department had 19 continental and three extracontinental hospitals, two hospital ships, and one mobile hospital. The total patient census in naval hospitals rose from 7,723 as recorded in June 1941 to 13,274 in 1942.⁽¹⁾ With this rapid increase, it became apparent that more hospital beds would be necessary to accommodate expected casualties. Accordingly, the Medical Department expanded the bed capacity of its existing hospitals by adding H-type frame ward buildings to its hospital facilities, decreased the normal peacetime 8-foot interval between beds to 6 feet, and constructed new naval hospitals abroad

and in the continental U.S. Among the new facilities commissioned were convalescent hospitals.

Convalescent Hospitals

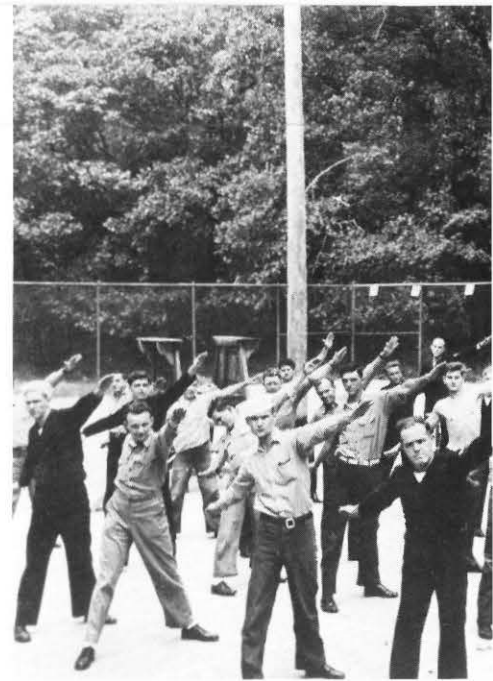
In 1942, the Navy entered a new phase of its special hospital program.*⁽²⁾ For the first time in the history of naval hospitalization, hospitals were being established to care solely for patients who required no further "treatment other than a change in climate, rest, good diet, psychotherapy, or physiotherapy."⁽³⁾

The hospitals were located near important debarkation areas to relieve general Navy hospitals that were overcrowded due to the influx of patients from the European and Pacific theater field hospitals. Ambulatory patients were transferred from the general hospital to the convalescent facility for the remainder of their recuperation period.

Rehabilitation

In addition to relieving general hospitals, convalescent facilities provided the atmosphere and physical surroundings conducive to rehabilitation. This comprehensive rehabilitation program included occupational and physical therapy, physical training, educational services, and civil readjustment. Social and servicemen's organizations along with civic clubs supplemented the rehabilitation program with recreational activities that helped to boost patient morale and, in some instances, provided forms of control exercise for coordination of unused muscles and limbs. The Red Cross even provided trained personnel to give instruction in arts and crafts. Similarly, the United Service Organi-

*The Navy began establishing special hospitals in 1882 with the establishment of the Army and Navy Hospital at Hot Springs, AR. This hospital was used by the Navy "chiefly in connection with those types of diseases and injuries for which the Hot Springs mineral waters have been found to be of special benefit." Since 1882, the Navy has designated and operated certain hospitals to care for and treat blindness, deafness, malignancy, poliomyelitis, psychosis, rheumatic fever, tuberculosis, amputations, neurosurgery, and plastic surgery.



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zation (USO) sponsored live entertainment, and the chaplains assisted patients in alleviating spiritual unrest that often impeded recovery.

The Bureau of Medicine and Surgery (BUMED) instructed commanding officers to set up programs most suitable for their hospitals. For example, USNCH Glenwood Springs, CO, was an excellent hydrotherapeutic facility because of its three hot water springs, bath houses, caverns, and year-round swimming pool. Similarly, the nearly 2,400 feet altitude, equitable climate, and low pollen and mold count at USNCH Banning, CA, made it an exceptional facility for treating patients with nasal, bronchial, and pulmonary diseases.

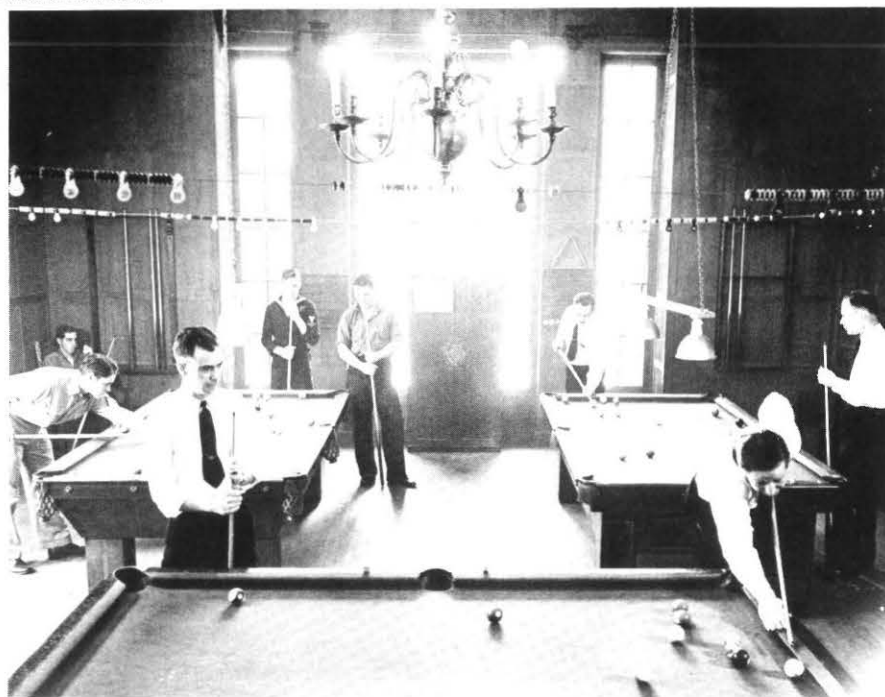
Some hospitals operated definitive divisions of the rehabilitation program. For instance, USNCH Arrowhead Springs, San Bernardino, CA, ran an outstanding educational services program, graduating patients from high school and junior college while they were under the hospital's jurisdiction. The occupational therapy program at USNCH Yosemite was also exceptional as it offered patients more than 13 vocational shops, like lapidary, bookbinding, and fly-tying.

Procuring the Property

The notion of convalescent hospitals first surfaced in prewar planning. Should the United States become involved in the war, the Navy would



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take over civilian institutions such as hotels, schools, resorts, sanitariums, and similar government facilities for emergency hospitalization usage.

In the summer of 1941, BUMED representatives began surveying sites that would be suitable for conversion to convalescent hospitals. One of the properties surveyed was the Lake Norconian Club in Norco, CA. In November 1941, BUMED sent a representative to survey the club, which was situated on approximately 700 acres of land overlooking a lake. On its grounds were a golf course, two outdoor pools, and several other recreational facilities. The Navy purchased the property but instead of establishing it as a convalescent hospital, it was commissioned USNH Norco, CA, which later became USNH Corona, CA. However, the hospital operated an extensive rehabilitation program comparable to those at the convalescent hospitals. In fact, early correspondence referred to the hospital as USNCH No. 1.

In 1944, the Army's Spadra General Hospital, located 22 miles northwest of Corona, was acquired and used as a convalescent annex for USNH Corona.

When a list of the most suitable sites had been compiled, BUMED sent members of the Planning Division to appraise the properties and to prepare conversion plans, which included data related to the facility's existing and

potential bed capacity and physical plant. The plans were then submitted to the Federal Board of Hospitalization for approval and subsequently to the Bureau of Yards and Docks which contracted companies to renovate the properties. The Division of Public Works, within the hospital's district, ensured that alterations were completed to the satisfaction of BUMED.

The amount or extent of renovations varied for each facility. Some sites like the USNCH Banning, a former emergency hospital for the 297th Army field hospital, required much work. Its grounds had to be landscaped, floors had to be covered, and its buildings insulated. Other facilities, like USNCH Asheville, NC, a former mental institution, required few renovations.

The Surgeon General appointed prospective commanding officers to the hospitals shortly after the beginning of construction. They kept BUMED informed of the progress being made at the sites and made suggestions on ways to improve the compound. When renovations had progressed to where additional personnel could be assigned to the facilities, the Secretary of the Navy officially established the hospitals.



Clockwise from top left: At the U.S. Naval Convalescent Hospital Yosemite National Park, CA, patients exercise on the tennis court . . . enjoy a game of pool and . . . hone their skills by spending time in the library as part of physical therapy.

Then when the compounds were suitable to receive patients, the Surgeon General commissioned the facilities. Theoretically, a hospital didn't receive patients until it was commissioned but, occasionally, hospitals were placed into active service before the commissioning date to accommodate large numbers of casualties.

The Navy acquired the facilities by lease from private citizens and businesses, by transfer with other government agencies, and by intertransfer

Convalescent hospital patients receive occupational therapy in this 1943 painting by Carlos Andreson.

within the Department of the Navy. In support of the war effort, some civilians offered facilities to the Navy to be used as hospitals. One such patriot was Mrs. Amy Guest, a resident of Palm Beach, FL. Mrs. Guest offered her palatial home to the Navy as a convalescing hospital facility on 2 Nov 1942. Upon her offer, BUMED recommended that her home be designated and established as USNCH No. 1 Palm Beach, FL. There is, however, no record supporting the official establishment of the Guest home as a Navy hospital. Nonetheless, a number of Navy officers received treatment there until 24 July 1943, when the home stopped functioning in this capacity.

Later, the Navy established the first official convalescent hospital in the home of a very prominent citizen, W. Averell Harriman, then a government official and ambassador to Russia from 1943 to 1946. Mr. Harriman offered his estate to the Navy on 6 Aug 1942. The Navy commissioned the property as USNCH Harriman, NY, on 16 Nov 1942 and the first patients were transferred there on 10 Feb 1943. With a bed capacity of 80, USNCH Harriman was the smallest convalescent hospital.

Special Hospitals

By 1945, the total patient census in Navy hospitals had risen to 90,635.⁽⁴⁾ This sharp increase in war casualties prompted the Navy to redesignate "U.S. Navy Convalescent Hospitals" as "U.S. Navy Special Hospitals" (USNSH) in June 1945 so that the facilities could operate at full capacity. No longer restricted in admitting patients solely labeled "convalescent," these hospitals opened their doors and embraced an abundant number of patients with acute diseases.

As the number of patients with acute diseases increased in the special hospitals, so did the number of potential discharges. Thus, educational services and civil readjustment became

Abbott Collection, Naval Historical Center



the two most essential parts of rehabilitation as the Navy attempted to lessen the social and economic effects permanent injuries would have on the future veterans. Educational services divisions began to furnish patients with more prevocational and post-vocational material instead of official publications that had been previously furnished to hone Navy skills. Likewise, civil readjustment division staffs were enlarged to accommodate the many in need of counseling concerning veteran rights and benefits. Civil readjustment personnel also collaborated with personnel at nonnaval facilities to assimilate rehabilitation programs for those patients transferring from the special hospitals to the nonnaval facilities for further treatment.

Some of the large general hospitals had special hospital annexes. Among these were naval hospitals in San Diego, CA; Norfolk NOB (Naval Operating Base), VA; Sampson, NY; Farragut, ID; Great Lakes, IL; Mare Island, CA; and Philadelphia, PA. Some of the annexes such as Swarthmore, the Philadelphia annex, served as a convalescing facility; others like Balboa, one of the USNH San Diego

annexes, functioned more like a general hospital.

Not the Perfect Haven

Occasionally, hospital officials reported to BUMED that their facilities could not fulfill their missions. The officials at USNSH Beaumont, CA, cited the regional climate and inadequacies in housing and recreational

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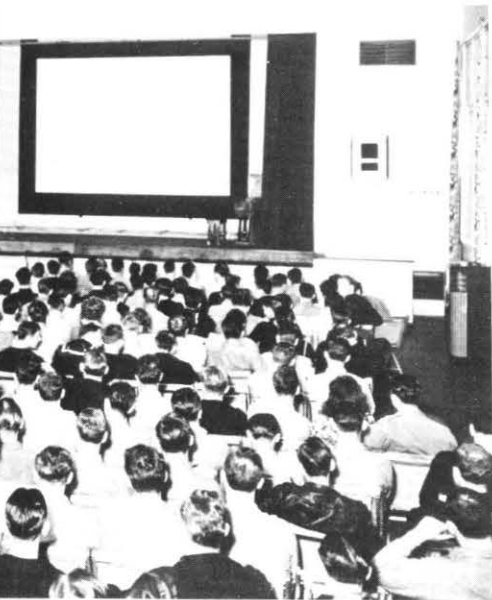
facilities as factors in USNSH Beaumont's ineffectiveness. Its living quarters lacked bathing and toilet facilities and its roofs leaked due to heavy rainfall. Similarly, officials at USNSH Sun Valley, ID, reported that isolation and poor transportation limited the recreational activities available to its patients during periods of liberty.

With the end of hostilities in September 1945, some special hospitals' doors had only been opened a few months. Now came the rapid closing of special hospitals and with them another chapter of Navy medicine. The former hotels, colleges, resorts, and sanitariums had served their purpose.

More than 40,000 war-battered sailors and marines received treatment at the special hospitals. Some returned to full or limited active duty, some transferred to nonnaval facilities for further treatment, and others returned to civilian life. Few, however, left in the same condition in which they had come.

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Convalescing patients often viewed movies in the recreation hall at the U.S. Naval Convalescent Hospital Yosemite National Park.

Results of Dental Corps Officer Survey

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As part of a comprehensive effort to review existing policies, improve management awareness, and facilitate long-range planning, the Chief, Navy Dental Corps commissioned the Naval Health Research Center (NHRC) to conduct an independent study of all active duty Dental Corps officers. The primary intentions were to evaluate attitudes and perceptions regarding the Dental Corps, to identify personal and career objectives, and to develop projections of turnover intent.

Survey Development

Based on input from the office of the Chief, Navy Dental Corps, the Naval Dental Research Institute, and practicing Navy dentists, NHRC developed a 68-item survey to assess demographic information, career profile, attitudes and perceptions of Dental Corps issues, areas of concern, and turnover intent. The survey was structured to collect quantitative information, or numerical ratings, on specific topics of interest as well as narrative input on issues identi-

Table 1
Demographic Summary of Dental Corps Officer Survey Respondents*

Designator:**			Rank:		Sex:		Age:	
	<u>N</u>	<u>%</u>		<u>N</u> <u>%</u>		<u>N</u> <u>%</u>		<u>Years</u>
2200	816	71	LT	389 37	Male	1,046 92	Mean	37.8
2205	338	29	LCDR	278 26	Female	93 8	Std. Dev.	7.6
	<u>1,154</u>	<u>100</u>	CDR	201 19		<u>1,139</u> <u>100</u>	Range	25-59
			CAPT	<u>185</u> <u>18</u>				
				<u>1,053</u> <u>100</u>				
Marital Status:			Children:		Housing:			
	<u>N</u>	<u>%</u>	<u>Mean</u>	<u>Range</u>		<u>N</u>	<u>%</u>	
Married	924	80	1.5	0-8	Own	596	52	
Single	178	15			Rent	338	29	
Divorced	44	4			Navy Housing	189	16	
Single Parent	<u>8</u>	<u>1</u>			BOQ	25	2	
	<u>1,154</u>	<u>100</u>			Other	<u>5</u>	<u><1</u>	
						<u>1,153</u>	<u>100</u>	

* Totals of less than 1,156 reflect missing data on a particular variable.

** 2200 denotes regular Dental Corps officers; 2205 denotes Naval Reserve Dental Corps officers.

Table 2

Primary Subspecialties By Education Level

Subspecialty	D: DDS/ DMD	J: Fully Trained	K: Board Certified	P: Master's Degree	S: Significant Experience	V: Formal Preparation	-- missing data	Total N	%
1700 General Dentistry	232	33	23	2	169	51	147	657	57
1750 Oral/Maxillofacial Surgery	0	26	43	0	25	2	3	99	9
1725 Comprehensive Dentistry	0	18	20	0	47	3	3	91	8
1769 Prosthodontics	0	51	15	0	19	0	0	85	7
1760 Periodontics	0	38	19	0	12	1	1	71	6
1710 Endodontics	0	22	24	0	18	3	1	68	6
1740 Operative Dentistry	0	7	6	0	3	0	0	16	1
1745 Oral Medicine/Diagnosis	0	1	8	0	3	0	2	14	1
1735 Orthodontics	0	8	2	1	0	0	0	11	1
1780 Oral Pathology	0	0	8	0	1	0	0	9	.8
1775 Public Health Dentistry	0	4	0	3	1	0	0	8	.7
1720 Dental Education Programs	1	0	0	0	2	3	1	7	.6
1795 Pediatric Dentistry	0	7	0	0	0	0	0	7	.6
1790 Dental Science and Research	0	0	0	0	4	0	1	5	.4
1730 Maxillofacial Prosthodontics	0	2	0	0	0	0	0	2	.2
1907 Health Services Quality Assurance	0	0	0	0	1	0	0	1	.1
Total:	233	217	168	6	305	63	159	1,151	100

fied by the respondents. Extensive effort was made to isolate the office of the Chief, Navy Dental Corps from the survey process to provide anonymity and to solicit honest and genuine responses. The anonymous surveys were returned to NHRC for processing and analysis, and the results were forwarded to the Chief, Navy Dental Corps. In addition, all narrative comments were detached from the surveys, grouped by rank, and forwarded to the Chief, Navy Dental Corps.

Findings

Demographic Information

A total of 1,156 Dental Corps officers (70 percent) responded to the survey between June and September 1990. Given the high response rate, the characteristics of the sample were very representative of the population of all Dental Corps officers. The demographic and professional characteristics of the sample are shown in Table 1.

Table 3

Mean Satisfaction and Mean Importance (n = 1,007)

	Satisfaction Mean	Importance Mean
<u>Higher Importance Items</u>		
Professional Camaraderie	4.28	4.34
Educational Opportunities	4.06	4.42
Professional Growth	3.86	4.55
Job Challenge and Variety	3.81	4.39
Job Security	3.67	4.35
Retirement Benefits	3.32	4.32
Medical Benefits	3.29	4.20
Family-Life Compatibility	3.23	4.35
Dental Technical Support Staff	2.61	4.19
Pay	2.56	4.40
Promotion Opportunities	2.52	4.53
<u>Lower Importance Items</u>		
Travel	4.06	3.74
Healthy Patient Population	4.00	3.18
Military Lifestyle	3.68	3.75
Equipment and Facilities	3.46	4.07
PCS Moves	3.41	3.90
Personal Recognition	3.04	4.02

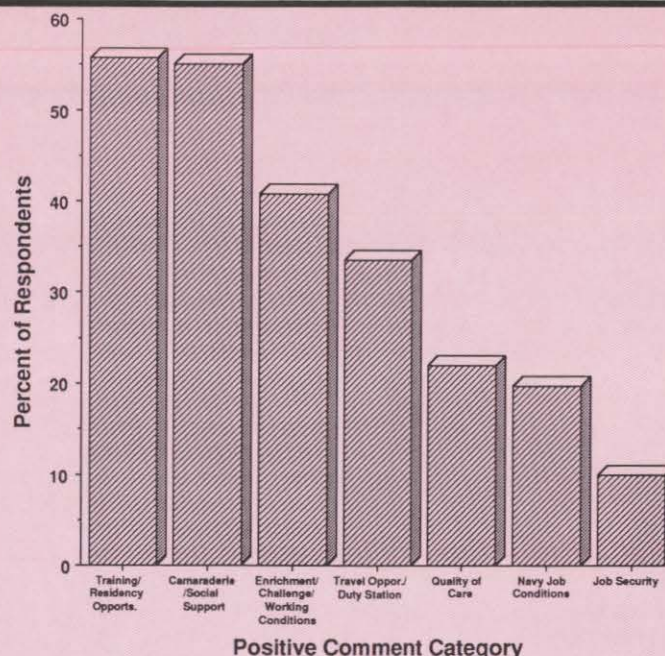


Figure 1. Percent of Individuals* Providing Narrative Responses Within Each of the Leading Categories of Most Positive Aspects of Navy Dentistry

* Given multiple response opportunities per respondent, totals sum to more than 100 percent.

Career Profile

Approximately two-thirds of the respondents were lieutenants (37 percent) or lieutenant commanders (26 percent) and about one-third were commanders (19 percent) or captains (18 percent). The distribution of respondents by subspecialty was as follows: general dentistry (57 percent), oral and maxillofacial surgeons (9 percent), comprehensive dentists (8 percent), prosthodontics (7 percent), endodontists (6 percent), periodontists (6 percent), and others (7 percent). A complete listing of respondents' primary subspecialty by education or experience level is presented in Table 2.

Attitudes and Perceptions

Professional Values. One of the most compelling findings of the survey was that important professional values, such as educational opportunities; professional growth; job challenge, enrichment, and variety; quality of care; and professional camaraderie were highly prized and well afforded within the Dental Corps. In response to objective numerical scales, the respondents rated these issues important and expressed reasonably high levels of satisfaction. The means for the perceived importance and satisfaction ratings of each item are presented in Table 3.

These results were corroborated by the narrative responses to the survey item which requested respondents to list the most positive aspects of Navy dentistry. As shown in Figure 1, the rank order of the most frequently cited responses was: (1) training and residency opportunities, (2) camaraderie and social support, (3) job enrichment, challenge, working conditions, (4) travel

opportunity and duty station, (5) quality of care, (6) Navy job conditions, and (7) job security.

Professional Environment. Within the private sector, a recent study indicates that while civilian dentists are generally satisfied with the practice of dentistry, they tend to be dissatisfied with the professional environment (e.g., malpractice risk), income, personal time, and practice management.⁽¹⁾ In this survey, dental officers demonstrated an appreciation for many of the professional advantages associated with Navy dentistry. These advantages include job conditions (i.e., no overhead costs, no collection problems, regular hours, etc.) and job security.

Camaraderie and Patriotic Values. Unlike most dentists in private practice, Navy dentists work in close association with many of their colleagues. This proximity facilitates both professional and social interaction and is viewed as a very positive aspect of the Dental Corps. Similarly, many Dental Corps officers expressed high levels of satisfaction with the military lifestyle. These attitudes often reflected a deep personal commitment to the Dental Corps, the Navy, and the nation. This commitment was generally founded on a strong set of patriotic values and the conviction that the pursuit of the mission of the Dental Corps was an important expression of those values.

Areas of Concern

Although many dental officers acknowledge and appreciate the high professional standards exhibited in Navy dentistry and are loyal to the organization, a number of problem areas were identified. On the objective numerical scales, the lowest levels of satisfaction were expressed on

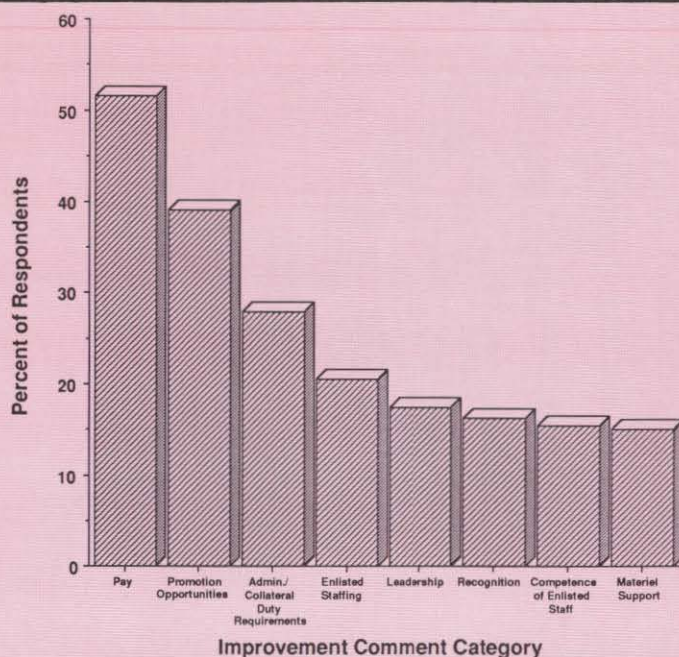


Figure 2. Percent of Individuals* Providing Narrative Responses Within Each of the Leading Categories of Areas of Navy Dentistry That Most Need Improvement

* Given multiple response opportunities per respondent, totals sum to more than 100 percent.

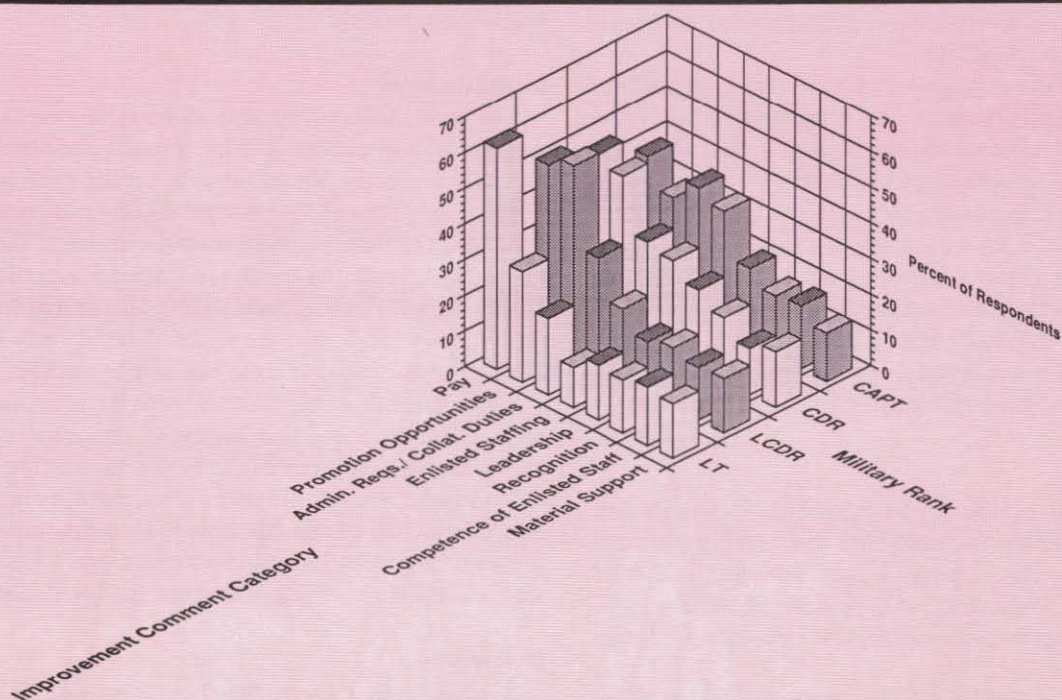


Figure 3. Percent of Individuals* Providing Narrative Responses Within Each of the Leading Improvement Comment Categories by Military Rank

* Given multiple response opportunities per respondent, totals sum to more than 100 percent.

items regarding promotion opportunities, pay, and dental technical support staff (see Table 3).

Some of the same themes were also represented in the responses to invited comments regarding areas of Navy dentistry which needed improvement. As shown in Figure 2, the following rank order of responses was obtained from the narrative comments: (1) pay, (2) promotion opportuni-

ties, (3) administrative and collateral duty requirements, (4) enlisted staffing, (5) leadership, (6) recognition, (7) competence of enlisted staff, and (8) materiel support.

While the order of these issues is generally consistent across military ranks, there are interesting differences in focus. For example, as shown in Figure 3, lieutenants tended to emphasize pay while lieutenant commanders and

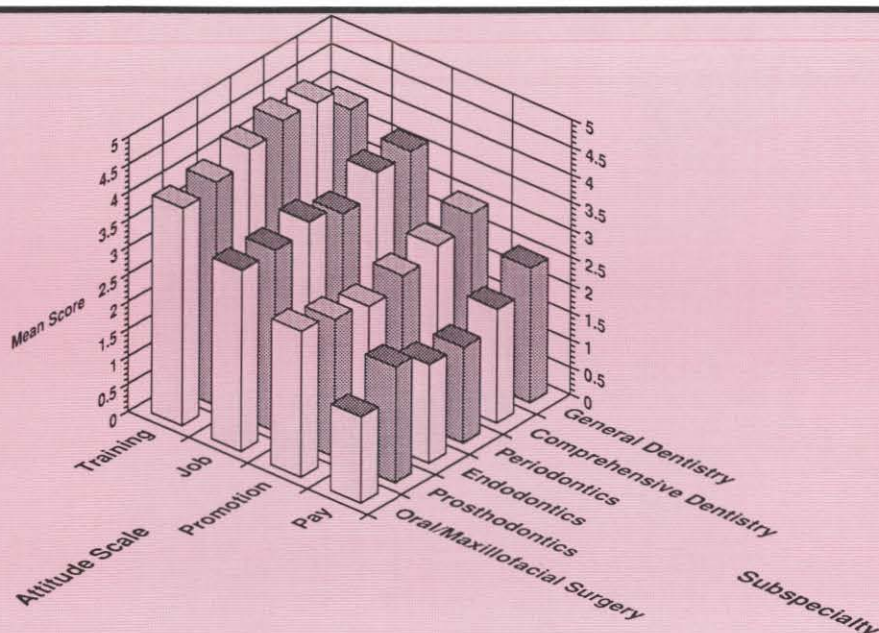


Figure 4. Mean Satisfaction Scores By Subspecialty Among LCDR Dental Corps Officers (n=277)

commanders focused more on promotion opportunities. Captains, on the other hand, more frequently identified issues related to administrative requirements or collateral duties, and enlisted staffing.

The expressed dissatisfaction with pay, which is particularly acute among lieutenants with large student loan commitments, is the most contentious issue across all ranks and is probably influenced by the perceived professional alternative of private practice.⁽²⁾ In this survey, most dentists believed that they could make more money in the private sector even after expenses. Such external comparisons may partially account for the fact the Navy specialists in oral and maxillofacial surgery, periodontics, and endodontics reported lower levels of pay satisfaction than general dentists, as shown in Figure 4.

Turnover Intent

Data provided by the Naval Personnel Research and Development Center indicate that the average annual turnover rate for Navy dental officers for 1988 and 1989 were as follows: lieutenants, 14.3 percent; lieutenant commanders, 4.9 percent; commanders, 4.1 percent; and captains, 9.5 percent.

The projected annual rates over the next 2 years based on the intentions expressed in the present survey were: lieutenants, 15.9 percent; lieutenant commanders, 7.8 percent; commanders, 3.9 percent; and captains, 10.2 percent. These projections indicate the greatest anticipated increase in turnover to occur among lieutenant commanders. The results of the present study also indicated that dissatisfaction with pay, the job, and promotion opportunity were significantly associated with intent to leave the Navy. Additionally, among lieutenant commanders the oral and maxillofacial surgeons, periodontists, and endodontists

were three times more likely to express an intent to leave the Navy as the general dentists, prosthodontists, or comprehensive dentists.

Conclusions

The individuals who responded to this survey provided thoughtful and candid insights into the issues confronting the Dental Corps. The results have been presented to the Chief, Navy Dental Corps and to the Commanding Officers' Conference at the 97th annual meeting of the Association of Military Surgeons of the United States. In addition, a briefing booklet has been widely distributed throughout the Dental Corps, and a technical report has been published and is available from the senior author.

This material is believed to provide a framework for more intensive focus and review at the clinic, command, and headquarters levels of the organization. The quantitative and qualitative information provided by the respondents of this survey should provide a sound empirical basis for an improved understanding of the Navy Dental Corps and a valuable heuristic for future policy deliberations.

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New Concept in Active Duty Women's Health Care

LCDR Maureen McAvoy, NC, USN
JOC John S. Verrico, USNR

In response to a 1988 survey by the Office of the Assistant Secretary of Defense (Health Affairs), active duty women can now look forward to a whole new approach to health care.

The concern for women's health issues has escalated with the dramatic increase of women in the military, from 1.6 percent in 1973 to 10.8 percent in 1989. Navy medical facilities are aware of the special health care needs of women, and many have responded with new programs tailored to meet those needs.

Among those issues being addressed, specifically in the areas of obstetrics and gynecology (OB/GYN), the annual PAP smear was identified as the area requiring the most attention. Previously, women needing to schedule this important diagnostic test might have had to wait months for an appointment, and then several more months before the test results were available. That much time passing between health assessments diminished the benefits of the test, specifically early detection of cancer of the cervix.

Health care facilities throughout the Navy and Marine Corps have looked at restructuring their programs to complete these tests on time. Many have made changes to "the system" to ensure priority appointments, better accessibility to care, shorter waiting times to be seen once arriving for

Photos by Jim Allen



A young sailor educates herself with a variety of women's health materials.



HR Robyn Pierce checks for an ear infection.

appointments, and prompt receipt of test results—all of which had been pinpointed as areas for improvement. For example, the Naval Medical Clinic at Quantico, VA, is now holding weekly PAP clinics for active duty women, with waiting periods of no more than 2 weeks for an appointment.

The U.S. Naval Hospital in Keflavik, Iceland, reported that it has completely eliminated the waiting list

for routine PAP smears with the addition of a third family practice physician and a schedule adjustment that nearly doubled the number of available appointments. Keflavik has also reduced the wait in obtaining PAP smear results from 4-6 weeks to only 5 days by contracting the lab work to a local Icelandic hospital rather than sending specimens back to the United States.

The need for female-specific health education, including self-examinations for breast cancer, birth control, and the prevention of sexually transmitted diseases, has also spawned a number of new programs throughout the Navy medical community, and women's health clinics and health education classes are springing up around the globe.

One of the largest of the new types of clinics is the Active Duty Women's Health Care Clinic of Naval Hospital Orlando, FL, at the Naval Training Center (NTC), which completed more than 4,000 PAP smears in the first 7 months of its operation. NTC Orlando is the Navy's sole site for female recruit training with approximately 9,000 women completing basic training each year. These recruits are introduced to Navy health care at this clinic.

To meet the medical needs of these recruits, P5 day (fifth preparation day of training) was established through a collaborative effort with the Recruit Training Command. On P5 day, the halls of the clinic are filled with female recruits scheduled to receive annual PAP smears and attend lectures on breast self-exams, family planning, and prevention of sexually transmitted diseases. This early medical screening allows for obtaining test results and performing appropriate followups or referrals prior to completing basic training. By screening before duty assignment orders are issued, the Navy saves thousands of dollars annually.

The clinic also serves the more than 2,000 active duty officers and enlisted women assigned to commands aboard NTC, including staff and students. Having addressed the needs of the recruits, it was now necessary to address the rest of the active duty women. Unable to use the P5-day approach, the clinic sends "birthday cards" to each active duty woman to remind her to schedule her annual exam. It also initiated a monthly newsletter to help meet the educational needs of active duty women.

Orlando's program adopted the motto "Wellness through education." The focus: easy access, early detection,



HN Zach Wilde takes a temperature reading. Right: ENS Glenn Gaborko, a physician assistant, reviews a recruit's medical record. The patient has stress fractures in both ankles.



prevention, appropriate referral/followup, and education. To this end, a Health Information Center was developed to provide centrally located, easily accessible health information. This center is the hub of the clinic. Visitors browse through educational material, watch health promotion videos, and meet with staff members who are on hand to answer questions and provide training.

Orlando's hospital, like so many others, formed an Active Duty Women's Health Care Program committee to develop the program to meet the needs of active duty women. The primary goal of committees like these is to establish a convenient, centrally located, time-efficient method of providing health care specifically for women in the military. Active duty women are now receiving care that is just becoming the state of the art in the civilian community. Health promotion education is available to all women with programs covering self-exams for breast cancer, family planning, sexually transmitted diseases, sexual assault, nutrition, exercise, and even smoking cessation.

As the new system continues to expand, methods of networking among clinics at the individual's past, current, and next duty stations are being developed.

Making these changes and instituting the new programs has not been an easy endeavor. OB/GYN physicians in the Navy are few and far between—currently manned at about 67 percent, with projections into next year at about 51 percent, based on prospective losses and potential gains from all avenues of accession.

The Navy Surgeon General, VADM Donald F. Hagen, MC, has made OB/GYN physicians his number one recruiting priority, and the Bureau of Medicine and Surgery (BUMED) is investigating a variety of avenues to boost OB/GYN accession, such as changes in legislation and financial bonuses. Other providers that make up the OB/GYN health care team include nurse midwives, family and OB/GYN nurse practitioners, physi-



cian assistants, and family physicians who are also in short supply but are "standing by to assist" and have been dedicated to providing quality health care.

To assist in women's health care education, BUMED has published a brochure on women's health care needs. Copies of this brochure are available for ship or shore commands, Navy medical facilities, ombudsmen, and other interested organizations by contacting the Bureau of Medicine and Surgery, Department of the Navy, MED OOP, 2300 E Street, NW, Washington, DC 20372-5120. Telephone: DSN 294-1315 or Commercial (202) 653-1315.

LT Greg Fuller, Orlando's clinic medical director, and HM2 Laura Naughton, examine a patient's X-ray.

These new programs providing special attention to gender-unique health concerns are just a few of the steps being taken by Navy medical treatment facilities as they strive to provide the best health care possible to all their beneficiaries. □

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Highlights From the Naval Medical Research and Development Command

Bethesda, MD

• Biological Effects of Locally Administered Cytokines With Unique Cytokine-Agarose Block Model

Cytokines, a diverse group of secreted cellular molecules (cytokines are also called lymphokines, monokines, interleukins, and interferons), are produced by a wide variety of cells. Cytokines have been used clinically to enhance the immune competence of individuals against certain tumors and infections, but treatment with these immune modulators is restricted due to their many adverse side effects. In order to reach effective local concentrations, the systemic dose required approaches toxic levels. Researchers in the Enteric Disease Program, at the Naval Medical Research Institute, Bethesda, MD, developed a unique *in vivo* murine model for the local delivery of cytokines which mimics the direct production of cytokines at an infection or wound site. This model uses implanted agarose blocks to administer cytokines to specific tissues *in vivo*. Cells attracted to the blocks are harvested and cultured *in vitro* so researchers can study the kinetics and phenotypes of cells (neutrophils, lymphocytes, and macrophages) attracted by the cytokines as well as the functions (phagocytosis and cytokine production) of these cells. The cytokine-agarose block model provides a new capability for studying cytokine control of local immune responses that are important for the elimination of microbial infections, the control of tumor growth, and the enhancement of wound repair.

* * *

• Evaluation of Cognitive Performance Following Substance Abuse

Various research studies have shown that alcohol abuse impairs an individual's ability to perform tasks in general and has specific detrimental effects on cognitive performance. Alcoholics who remain abstinent will evidence substantial cognitive recovery, however, the question remains as to whether cognitive capacity returns to pre-abuse levels. Although alcoholics treated by the Navy are given formal treatment at Navy Alcohol Rehabilitation Centers (NARCs) and are encouraged to abstain from alcohol, no testing is done to ensure they are cognitively fit to return to duty. Researchers in the Cognitive Performance and Psychophysiology Department, Naval Health Research Center (NHRC), San

Diego, CA, are currently evaluating the use of event-related brain potentials (ERPs) as a tool for measuring various aspects of cognitive performance. Using ERP component parameters as a measure enables the functional aspects of cognition (filtering, discrimination, memory encoding, memory retrieval, and decision making) to be observed. The optimal performance of many Navy jobs requires that these abilities be intact. A 1-year longitudinal study has been conducted on alcoholics at NARC San Diego, in order to identify changes in ERPs that may occur during rehabilitation. The results of this research may lead to an objective method for tracking cognitive rehabilitation.

* * *

• Malaria Vaccine

Malaria, a serious parasitic disease spread by Anopheline mosquitoes, kills more than 1 million of the 270 million people infected each year and is a major threat to deployed troops in endemic areas. The single-cell parasite responsible has a complex life cycle that makes it a difficult vaccine target. Since the parasite changes during its life cycle, vaccines that work against one stage may not work against others. The ideal vaccine would target every stage of the malaria infection. In a major step toward development of a comprehensive human vaccine, researchers in the Malaria Program at the Naval Medical Research Institute (NMRI), Bethesda, MD, have successfully inoculated laboratory mice with a dual-action vaccine that targets two key proteins on the malaria parasite. The two proteins are the circumsporozoite (CS) protein and sporozoite surface protein 2 (SSP2), which was recently discovered at NMRI. NMRI researchers believe that the vaccine stimulates cytotoxic T cells to attack the parasites in the liver; antibodies produced against the CS and SSP2 proteins also may be inhibiting sporozoites. The mouse vaccine is not directly applicable to humans, but researchers believe a vaccine that targets these same proteins on the human malaria parasites would be equally effective. They are currently working on identifying the human malaria parasite counterpart of SSP2 and on developing effective ways of delivery to humans.

For additional information on these or other medical R&D projects, contact NMRDC Code 04 at Commercial (301) 295-1468 or Autovon 295-1468.

Panic Attacks and Suicide Concerns

Two Important Issues in Navy Medicine

CAPT Terrence Riley, MC, USN

Navy vessels are populated by young people in highly stressful, often sleep-deprived environments. It is not surprising that many problems seen in the young adult population in general should be conspicuous in our crews made up almost entirely of young adults. Two such problems have been the focus of much attention on USS *Forrestal* (CV-59) in the past 2 years, initially because the senior medical officer was interested in both clinical entities, and because both occurred so often. Suicide is the first of these, panic attacks the second. Although these might appear to be two distinct and independent problems, recent evidence suggests that they might be related.(1-3)

Suicidal ideation or suicide threats have become more and more common in the past 30 years;(4) preventing suicide is a major initiative in the Navy. Panic attacks and panic disorders have only been recognized as clinic entities for about a decade (5,6) although they have clearly been around for a long time, if not forever.

Suicidal Ideation and Suicide Threats

Suicide is a major worldwide health problem. In the United States it is now the third leading cause of death among people 15-24 years of age.(7) A high rate among major psychiatric diseases, especially schizophrenia, has been long recognized and requires careful attention among psychiatric patients.(8) While overt psychiatric disease is less common than personality disorders among active duty military personnel, those with personality disorders also are at risk. Those with *antisocial personality disorder* are especially prone to suicide threats and to violent impulses

that can lead to suicide. Tragically, this may happen even when the motive began as an attention-gaining device, with no death wish at all. Suicides, suicidal gestures, and suicidal threats have all increased in the military, of course, as they have in the world at large.(9)

Since the motivations for considering or threatening suicide vary widely among patients, prevention requires awareness and attack on all pertinent fronts. Some intuitive or "conventional wisdom" about threats for suicide are not entirely true. Most people, indeed most care providers, think of depression as a risk factor, but clinical depression alone is not a significant warning sign for suicide, although a disruptive depressive turmoil may be.(3)

In a study of the factors most predicting a successful suicide, Fawcett showed that a pervasive sense of hopelessness had the greatest predictive value. By contrast, factors that do not seem to predict short-term risk include suicidal ideations, previous suicide attempts, and mood cycling.(3)

A rather startling association is the incidence of suicide attempts in people with panic attacks and panic disorders. As many as 20 percent of people with panic disorder have attempted suicide at some time in their lives, compared to 12 percent with less frequent but recurrent panic attacks, and only 6 percent of patients with other psychiatric diagnoses, and only 1 percent of controls in the studies of Weissman et al.(1) Stated another way, the odds of suicide attempt are 18 times higher among patients with panic disorders. How often *completed* suicide occurs in patients with panic disorders or clinical panic situations has not as yet been defined. Until prospective studies of significant size can be done, only inference from suicide attempts can

be applied to speculation on true risk for completed suicide.

Panic Attacks and Panic Disorder

Sheehan focused attention on panic disorders only about 10 years ago,⁽⁵⁾ but the clear and recurrent features of the syndromes were so reproducible, recognizable, and frequent that panic attacks and panic disorder quickly appeared in DSM-III and won much clinical attention.

The essential features of panic attacks differ from generalized anxiety and phobias. Recurrent, unpredictable episodes of sudden intense apprehension or fear are the key.^(6,10) These are spontaneous, not reactive, and often bring forth a number of physiologic effects that perplex and befuddle the doctor as much as the patient and family. These may include dyspnea, palpitations, chest pain or discomfort, choking, dizziness, sensations of unreality, trembling, premonitions of death, or perceptions of visual distortion.

Frequency of attacks distinguishes panic attacks from panic disorder. According to DSM-III the definition of *panic disorder* requires the occurrence within a 3-week period of three panic attacks, not solely precipitated by exposure to a specific fearful situation. At least four of the symptoms listed above must occur in each attack. Not every patient with panic attacks, therefore, has panic disorder.

As Sheehan has pointed out, *panic may be one of the great impostors in medical practice.*⁽⁵⁾ As a neurologist, I have seen a number of people treated erroneously for seizure disorders because sudden eruptions of trembling and/or paresthesias were interpreted as epileptic symptoms. In one series of 195 patients with atypical chest pain in a cardiology clinic, 59 fit the diagnostic criteria for panic disorder.⁽¹¹⁾ The protean manifestations of panic attacks and panic disorders can mimic asthma, vertigo, angina, irritable colon, cardiac arrhythmia, and airway obstruction.⁽¹²⁾ Several of these are potentially life-threatening conditions, and others would render a person unfit for sea duty, so they have several reasons to interest the ship doctor.

Panic attacks are common in the general population, especially so in the age group we have on Navy vessels and in the Marine Corps. Panic attacks recur occasionally in 10 percent and frequently in 3 percent of people.⁽¹³⁾ In a study of prevalence of a number of psychiatric diagnoses in five different sites in the United States, 1-month prevalence of panic disorder ranged from 0.4 to 0.7 per hundred persons over the age of 18.⁽¹⁴⁾ A similar 1-month prevalence on an aircraft carrier would imply 20-35 patients with panic disorder if looking at 1-month prevalence, more than that over the course of a long deployment involving 6 or more months. In each of the five catchment areas, panic disorder was more common than somatization disorder, overall by more than fourfold!

Panic attacks, depending upon the frequency of the

attacks, may be effectively treated with general anxiety-reducing measures, by moderate doses of benzodiazepine medications (alprazolam, often favored), or by tricyclics. Hence, a primary reason for recognizing the entity, is that specific treatment may reduce attacks and by implication possibly reduce lost work production, sick call visits, and, hopefully, suicide attempts.

Survey on an Aircraft Carrier

It behooves us to pay attention and learn more about panic attacks and panic disorder in Navy medicine. They are frequently the cause of hypochondriacal symptoms in our sick calls, and probably much more common than the better-known entity of somatization disorder. Recognition of panic symptoms when they mimic a more dangerous disorder, such as arrhythmia, may save unnecessary trauma to the patient and untoward disruption in the command with unnecessary, inappropriate emergency intervention. Also, if panic attacks carry a higher risk for suicide, they may identify a group who need closer scrutiny.

In a survey conducted on *Forrestal* in March 1990, 0.5 percent of respondents met criteria for panic disorder, and a total of 1.8 percent had at least occasional panic attacks. Both of these figures are consistent with other nonmilitary studies. This being an initial, widely-distributed survey, it had a few failings. Many members, especially aviators, suspected the survey results would expose them to career-threatening investigation, so their responses may have been less than candid. However, consistency with prior studies implies that the carrier population has a similar prevalence of panic attacks and disorder to previous groups. There was not a reliable statistical association or correlation between numbers of sick call visits, problem list diagnoses, or hypochondriasis in our group. However, a detailed followup study has not been done.

The survey also asked whether the subjects ever had a serious impulse to kill themselves. A total of 43 subjects answered affirmatively. All but five of those had experienced more than two symptoms of panic attacks. Of nine subjects who considered suicide "often" each had previously experienced sudden panic symptoms, and seven had *several* symptoms, implying classical panic disorder.

This survey, an initial inquiry, suggests that the prevalence of panic attacks and panic disorder are as common among the young men on a naval vessel as in the general population. Most of the respondents who admitted considering suicide had symptoms of panic attacks, and those who considered suicide most often had responses that call attention to panic disorder. Admittedly, conclusions should be restricted in a brief initial survey of this sort. For example, the reliability of responses in a shipboard setting can be challenged; a firm diagnosis is certainly not established by a survey. However, in light of earlier reports, this survey suggests that members with panic symptoms coming to medical attention, especially recurrent disabling

panics, deserve special attention from the ship's medical department.

Treatment and Prevention

This article is not intended to be an exposition about suicide. There is an exhaustive literature on the subject. However, all Navy physicians, nurses, and corpsmen must be familiar with BUMED Instruction 6520.1A of 31 March 1986, "Evaluation and Disposition of Patients Presenting With Suicidal Ideation or Behavior." Those who deal with the threat of suicide often know that we have much to learn.

In the military, especially the sea service, there is the lurking awareness that the one factor that instigates a suicide threat or a suicide gesture may be avoidance . . . avoidance of deployment, disciplinary action, or even continued service. Doctors in operational settings contend frequently with this dilemma: caring properly and compassionately for the patient with the suicide threat or gesture, yet knowing that often the threat or gesture is goal-directed or a ruse and not genuinely suicidal in intent.

Because any gesture can become dangerous, each threat and suicidal comment must command immediate and vigorous attention. A distinction *can not* and *must not* be made between "genuine" or fraudulent gestures or threats by the operational doctor (or, frankly, most doctors) based on a presumption of the subject's motives. Yet, most of us "in the fleet" know that many, perhaps most, of the threats are manipulative or even fraudulent. *It may be that even the prevention of manipulative threats should be identical to that of more genuine or sincere threats.*

Once risks such as schizophrenia are eliminated (and they are rare in our population), we have too few signs and means to identify future suicides or threateners. So we can not as yet focus those at risk for preventive programs. Our initial studies suggest that panic attacks and especially recurrent panic disorder may well merit serious attention. Still, at present, successful prevention must be widely-based, leaving out none who even could be at risk. Attitudes and social mores among members of a command are probably the most effective and powerful means to arrest the burgeoning throng of suicide threats.

The most prominent and important deterrent is a sense of belonging, of worth to self and to comrades. Of course, fundamental military leadership calls for making all members feel integral and belonging to the command. Also, members should have recreation and rest to permit pleasure and satisfaction. But more is needed. When despondent, lonesome, or in whatever mode needful, suicide or suicide threats should not be a desirable or viable choice. A social disdain/distaste/unacceptance for suicide is necessary. In an unavoidable dilemma, our obligatory and essential concern for the well-being of people who threaten suicide has, in a way, communicated, albeit inaccurately, an acceptance of suicide gestures or motives. It is, of course, the individual that we wish to accept, not the act

nor the motive.

Until the culture and all members of the population at risk develop an intolerance for the motive or idea of suicide, we will be futilely trying only to "catch up" with the threats and gestures that have already been conceived or committed. This doesn't work for illegal drugs, and probably won't work for the suicide and suicidal threat/gesture epidemic either. There is some evidence to support the idea that attitude adjustment can be influential. It is well substantiated that suicides and suicidal plans occur far less among religious or church-going groups. A form of "Just say no" or perhaps more properly, "Just don't think about it" education must be carried on with special attention to young members just entering the Navy and to operational, deploying units. This would probably be most effective in boot camp and on individual ships, in order to best instigate personal discussion and commitment among the young members at greatest risk.

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Navy Medicine 1943



Corpsmen guard Guadalcanal sick bay.

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